



FRIDAY, MAY 6.

NEWS OF THE WEEK.

We give below, in a condensed form, the leading news items of the week. These items will be found in detail in their appropriate columns.

Meetings next week.—Delaware & Hudson Canal Co.; Missouri Pacific; St. Louis & San Francisco.

Elections.—Denver & Rio Grande, David H. Moffat, President; S. T. Smith, General Manager.—Central Ohio, J. H. Collins, President.—Chicago, Milwaukee & St. Paul, Frank Bond, acting President.—Cleveland & Southwestern, Donald McNaughton, President.—Little Rock & Fort Smith, Little Rock Junction, and Kansas & Arkansas Valley, George J. Gould, President.—New York, Wheeling, St. Louis & Chicago, Henry Sohn, President.—Mississippi River & Northwestern, W. B. Dutton, General Manager.—Pittsburgh & Lake Erie, Elliot Holbrook, Chief Engineer.—St. Louis & Chicago, L. S. Graves, Superintendent.—Valley, A. Gordon Jones, Superintendent.—West Virginia Central, A. P. Gorman, President.

New Companies Organized.—Baltimore & Western is incorporated in Maryland.—Wilmington and Northern, T. B. Hibbard, Superintendent.—Helena, Boulder & Madison filed articles in Montana.—Helena, Gallatin & National Park filed articles in Montana.—Rock Point Terminal & Transfer incorporated in Minnesota.—Southern & Ohio River obtains charter in Indiana.—Terre Haute & Mississippi River organized in Indiana.—Delaware & Ostego is organized in New York.

Changes and Extensions.—Connecticut: Meriden & Cromwell is to be extended to Waterbury.—Kansas: Chicago, Rock Island & Pacific will build westward from Horton.—Kentucky: Ohio Valley is completed to Marion, Ky.—Massachusetts: Boston, Revere & Lynn will build new mileage.—Michigan: Detroit, Lansing & Northern will build from Lansing to Grand Rapids.—North Carolina: Monroe & Atlanta is being graded.—Ohio: Columbus, Lima & Northwestern institutes survey.—West Virginia: West Virginia Central will be extended 100 miles.

Personal.—L. A. Bowers resigns Superintendency of Wilmington & Northern.—Judge J. P. Usher resigns his position with the Missouri Pacific.—W. S. Jackson resigns Presidency of Denver & Rio Grande.

Leases and Sales.—Boston & Maine leases the Northern of New Hampshire.—Fitchburg consummates purchase of the Boston, Hoosac Tunnel & Western.

Traffic.—Anthracite coal shipments for the week ending April 30 show an increase of 47.7 per cent. as compared with corresponding week last year; bituminous shipments show increase of 85.4 per cent.; coke for the week ending April 29 shows increase of 18.1 per cent.—Cotton receipts, interior markets, for week ending April 29 show a decrease of 61.8 per cent.; shipments a decrease of 63.7 per cent.; seaboard receipts decrease of 62.4 per cent.; exports a decrease of 44.1 per cent.; cotton in sight is less than at same date last year by 45.5 per cent.

Earnings.—Ten roads report gross earnings for April, 9 showing an increase and 1 a decrease for the month.

Miscellaneous.—Injunctions are served to prevent consolidation of Fitchburg with Troy & Boston.—Missouri Pacific assumes control of the Arkansas Valley Route.—Missouri Pacific will build its shops at Atchison, Kan.—Pittsburgh, Lackawanna & Northwestern changes its title, and will consolidate with other roads.

Contributions.

Rail Sections.

LONDON, April 19, 1887.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Your issue of the 8th instant, just arrived, contains a paper on this subject by Mr. Mattes, with illustrated sections several bearing my name. It also contains on another page an expression of opinion by Mr. Forney that the copying of rail sections is a most severe test of a draughtsman's skill. In this I fully concur, particularly when the sections are at the same time reduced in size.

Take, for instance, fig. 4 on page 230—Sandberg's 70 lbs. I hardly know my own child again. I inclose an original drawing, so that you may form your own judgment upon it. The depth of the head should be 1½ in. instead of 1 in. The error, however, should not be attributed to your draughtsman, who has probably been misled by an indistinct figure into reading ½ as ¼—an accident which makes all the difference between showing a big head or a small head. For each railway it is of great importance to keep to exactly the same section, so as to insure a good fit of the fish-plates, whether the rails are made in half a dozen places or in one. As only a very trifling error in measurement, say one thirty-second of an inch, would spoil a good fit, templates made to female gauges should be supplied and worked to, as accuracy is not always secured when working from drawings. In this instance I had been furnished with a proof by the secretary, Dr. Raymond, and observed the mistake on my 70 lb. rail, so that your draughtsman is certainly free from blame in this respect.

I have no desire to continue the discussion as to which form of rail section is the best. It is all a matter of taste. Just as it is impossible to make a salad to please everybody, or a lady's bonnet, so let every one have his own opinion. But I

should like rather to direct the attention of engineers to the necessity of adopting stronger and heavier rails of any section they choose. It is evident that the time has come when, owing to the increase of traffic, both safety and economy demand a stronger track, and it would be a pity if engineers should hang themselves up in discussing the form and lose sight of the main points of giving strength and weight to do the increased work, and so run into the danger of simply increasing the hardness of the steel, while keeping to the old section and weight, which in many instances sooner or later will lead to accidents.

C. P. SANDBERG.

[The plates used in illustrating Mr. Mattes' paper were duplicates of those made by the Institute of Mining Engineers. The original drawings were not in our hands.—EDITOR RAILROAD GAZETTE.]

Welded Eye-bars.

BALTIMORE, April 26, 1887.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In your issue of the 8th inst. I find a communication from Mr. Fred. H. Smith on the Otter Creek Bridge, Norfolk & Western R. R., in which he speaks of the Baltimore & Ohio Railroad Company "yet" building bridges on welded bars, though he says, "I am not alarmed about properly welded bars, although, of course, I greatly prefer upset bars." I think it well that this notice should be accompanied by the reasons why the B. & O. R. R. Co. are "yet" using welded bars in building bridges.

The Baltimore & Ohio Railroad Co. has been building its own bridges for more than 35 years with spans from 10 to 300 ft., and in all welded eye-bars have been used, and to this date no bridge has failed on account of welded eye-bars. Several bridges have been carried down in freshets, many broken bars were found in the wreck, but none which had been broken in the weld.

Each finished bar is subjected to a strain of 20,000 lbs. to the square inch, and while under this tension the welded portion receives several blows with a hammer and is examined with a magnifying glass. If no flaw can be discovered with the glass or by the sound under the hammer, the bar is accepted and stamped in evidence of its having undergone this inspection. Do upset eye-bars show better results?

JAMES L. RANDOLPH, Consulting Engineer.

Car Load Rates.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The new official classification adopted by the Trunk Lines, which took effect April 1, 1887, has made many changes in the old order of things. One of the important questions thus raised is that of car-load rates. Should there be any difference in rates between car-loads and less quantity, and if so upon what articles and with what percentage of difference? About some kinds of traffic there can be but one answer. Grain, lumber, ore, coal, and the like divide themselves naturally into car-loads, have either special provision for their loading and unloading, or can be run upon side tracks for those purposes. But when we come to the small or house freight it is another matter; and in putting car-load rates upon much of this traffic, especially west-bound, the classification committee has departed entirely from precedent. Such a change is open to serious objections. Any great difference between these quantities, or, in fact, any difference at all, must result in raising the price to the consumer. Outside of the cities and large towns there are but few dealers who can buy so great a quantity, and no matter from what trade centre they buy, this increase is a certain result. In the case of food and other staples, this is reversing the long-settled policy. Now I believe that the maxim "the greatest good to the greatest number," should apply here as well as in politics. We should remember that land has been taken and votes given in thinly populated sections for the franchises of the railroads, and it is a matter of doubt whether the ignoring of the small tradesman is either wise or just. If it be true that our railroads perform functions delegated from the states, it is an additional argument, for we know from the carriage of letters and from other things what the policy of the government always is—a cheap and uniform rate for all as far as possible. I have said that car-load rates in the tariff for small articles will raise the price; this is true directly and also indirectly. Such rates practically compel the retailer to buy in the near-by trade centre. The result of this monopoly is the loss of competition, and this is serious, for it is competition between tradesmen and cities which keeps down the price and keeps up the quality in any article. If Chicago, Cincinnati, Detroit, New York, can all try to sell in any particular town and are all upon an equality, the resulting strife assures the merchants of that town the utmost advantages from open competition. Moreover, it would seem to be the right of every merchant in any section of the country to buy or sell in any market he may choose without artificial hindrance in transportation rates or conditions. Our civilization, commercially speaking, is but another name for a complete and full interchange of products.

It is a well-known fact that the larger firms have rarely if ever paid full tariff rates, and it is charged that the present classification is an attempt to perpetuate, under the guise of car-load rates, those rebates which it was the intention of the Interstate Commerce law to prevent, and, what is worse, the new differences are greater than the old. Under the old schedule, when sugar was fifth class in any quantity (25 cents New York to Chicago) a cut of three or five cents would at any time have commanded all that article in the New York market. Now the difference is 10 cents, twice or three times the old.

The reason given for the new classification is that the Inter-

state Commerce law compels such combination. This might be true of all the classifications in use in the one direction but cannot be made to apply to both east and west bound traffic without a forced construction. In the one section of the law where specific provisions are attempted (the long and short haul clause) the section expressly says "in one direction." The traffic east-bound is radically different from the west-bound. Eastward we have principally such bulky products as grain and lumber, of which we have spoken as falling naturally into car-loads, but westward the traffic consists mostly of broken freight. A similar classification and a similar rate upon any article in both directions may seem to be just, and may at the same time involve the greatest injustice. Agricultural implements will serve as an illustration. When made in the East the lumber and iron for their construction will very likely come from the West, and the implements themselves must be returned to the West, and there sold in competition with factories on the spot; for it should be remembered that it is the great markets of the West to which all manufacturers must look for future sales. Meanwhile the railroads bring from the West the breadstuffs to feed these Eastern operatives, and much revenue is received from passengers and for transportation of different lines of freights made necessary by the wide separation between manufacturer and consumer. But to carry out this plan, this factory must have such a rate upon its product as will enable it to sell in the Western markets as against home competitors, while such a rate does not belong in justice to the Western product moved eastward. The two cases cannot justly be compared; and no reasonable construction of the new law would require it.

The new classification says upon its face that it superseded the official east-bound, official west-bound, Middle and Western states, and joint merchandise classifications. I have mentioned sugar, so for the present purpose of comparison I will take that and a few other staples of the grocery trade. In the new classification, taking New York and Chicago as illustrations, the rates are for car-loads and less:

Articles.	Car-loads.	Less quantity.	Difference.
Sugar.....	25 cents.	35 cents.	10 cents.
Coffee.....	25 "	35 "	10 "
Molasses.....	30 "	35 "	5 "
Fish.....	25 "	30 "	5 "
Canned goods.....	30 "	20 "	20 "

I have examined the classification of these staples in the four original classifications which have been superseded, with this result:

Sugar.		Less quantity.
East-bound.....	No car-load rates	6th.
Middle and Western.....	" "	5th.
Joint merchandise.....	" "	4th.
West-bound.....	" "	5th.

Coffee.		Less quantity.
East-bound.....	No car-load rates	6th.
Middle and Western.....	" "	5th.
Joint merchandise.....	" "	4th.
West-bound.....	Car-load, 5th class.	4th.

Molasses.		Less quantity.
East-bound.....	9th class.	6th.
Middle and Western.....	No car-load rates	5th.
Joint merchandise.....	" "	4th.
West-bound.....	" "	5th.

Fish.		Less quantity.
East-bound.....	9th class.	6th.
Middle and Western.....	No car-load rates	5th.
Joint merchandise.....	" "	4th.
West-bound.....	" "	5th.

Canned Goods.		Less.
East-bound.....	8th class (35 cents.)	7th class (40 cents.)
Middle and Western.....	5th " (15 ")	4th " (20 ")
Joint merchandise.....	4th " (20 ")	3d " (25 ")
West-bound.....	No car-loads.	4th " "

In the canned goods table the rates mentioned for east-bound are from Chicago to New York, for Middle and Western they are from Pittsburgh to Chicago and for joint merchandise between Baltimore and New York. It will be noted that the difference between these two quantities in no case exceeds 5 cents. Compare this with the differences shown above in the combined classification. It will be noted that with all of these staples except canned goods it has been customary to have few car-load rates at all, and where they were made they are capable of explanation. As for example car-loads on molasses and fish east-bound, which according to my reasoning do not afford any precedent, at least for west bound traffic. The only other exception is that of coffee in the west-bound, and this was "sprung" into the west-bound classification within a year.

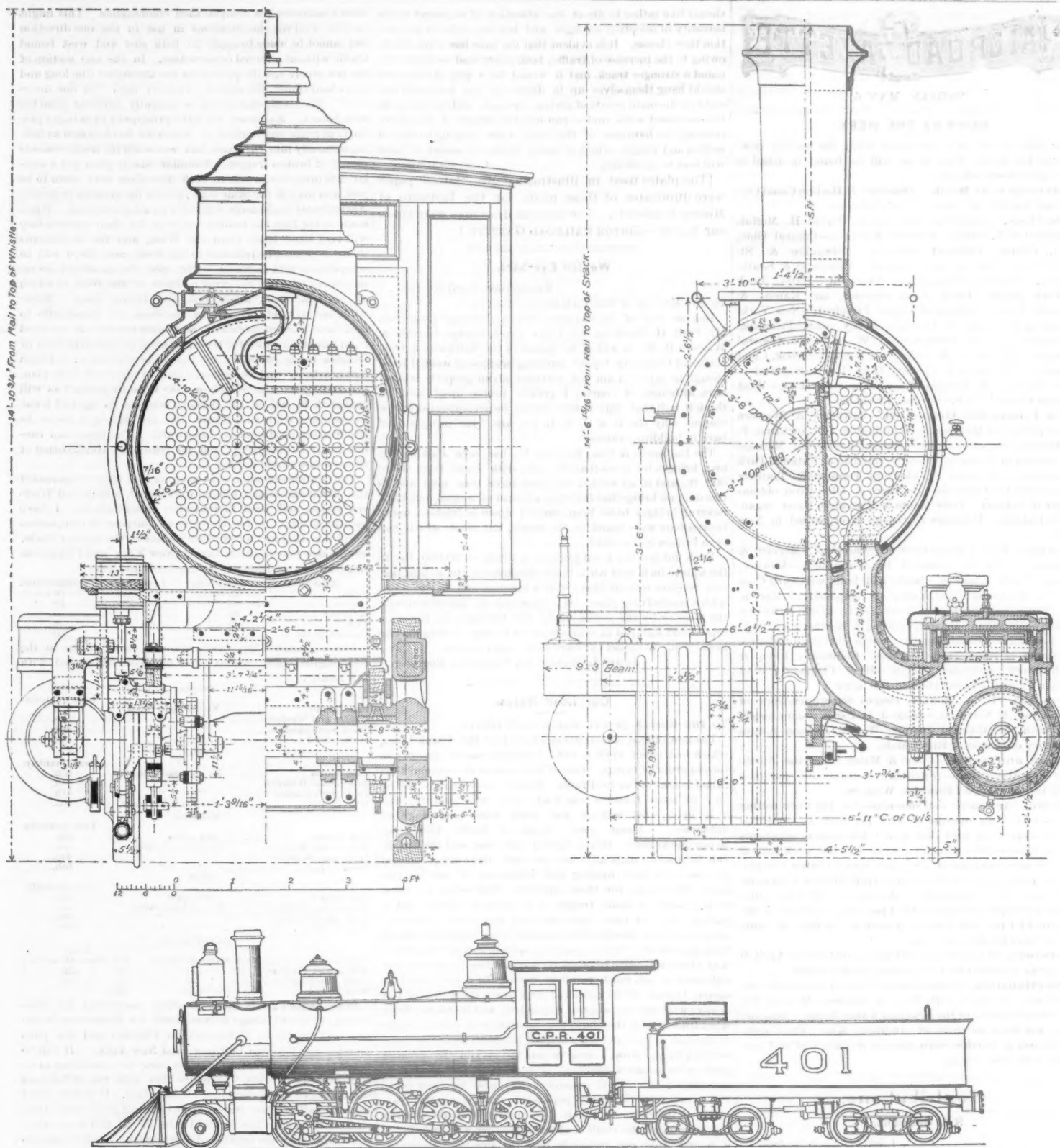
If any further evidence is needed to show the arbitrary and unjust rulings of the Classification Committee on this car-load question, I give below the schedule in use between Chicago and the Missouri River cities.

Articles.	Car-load.	Less.
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Sugar, molasses, rice, coffee, fish, canned goods.....	30 cents.	33½
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I ask a careful comparison between this tariff of the Southwestern railroads and that of our own. The difference in cents is seen at once. The Southwestern tariff shows an advance for the small quantities of only a trifle over 11 per cent. Compare this with an advance of 66½ per cent. on canned goods in our present absurd classification.

It is here a proper question, if the distinction of car-loads is to be the rule, why so many articles are allowed to pass without such rates? Why should butter, carpets, dry goods, hardware, and the like, be treated better than paper, nails, vehicles, and similar freight? Can anybody explain it? Is not a layman justified in charging the Classification Committee with inconsistency in "combining" in a new classification a feature not general in the four tariffs superseded, and in enforcing the new rule upon some articles and not upon others, and especially for putting the largest differences upon the very staples which are used most largely by the wage-earning classes? Should the rate upon small quantities in any case and upon any theory exceed the car-load rate by more than the additional cost of service?



CONSOLIDATION LOCOMOTIVE AND TENDER—CANADIAN PACIFIC RAILWAY.

The Southern Railway & Steamship Association at their recent meeting declined to adopt the new official classification, although it was given out that the Trunk Line Classification Committee was composed of members from the whole country, both South and West, and that their decisions were to be adopted as a universal classification. It is understood that one great reason for this refusal of the Southern roads was their sense of the injustice of these very car-load rates both to shippers and carriers.

JUDEx.

Consolidation Engine, Canadian Pacific Railway.

The accompanying illustrations show a class of consolidation engines, designed and built by Mr. F. R. P. Brown, Mechanical Superintendent of the Canadian Pacific Railway, at the shops of the company in Montreal. The engines are intended for working heavy freight service in the summer and to operate the passenger trains in emergencies in severe winter weather. These engines are the first consolidation engines built in Canada.

The principal features which distinguish these engines are the short stroke, 22 in., and the high boiler pressure, 160 lbs. per square inch, together with the large grate surface required to maintain that pressure. The weight of the engine is sufficient to almost entirely prevent slipping the wheels in good weather without the use of sand, thus saving the wear of tires and machinery, the designer being of opinion that a clean rail is much superior to a sanded one, though

sand boxes are provided both front and back, for emergencies in bad weather. The fixed wheel-base is extremely short for the diameter of the driving wheels, and the counterbalancing is carefully estimated, the result being that the engine can be run at high speeds and on curved roads with a remarkable degree of ease and steadiness.

The frames are forged solid from the back end to front of leading drivers, and the upper and lower bars of front end, which embrace the cylinders, are connected to main frame by spliced and keyed joints, not by butt ends depending upon bolts for strength. Both these bars are extended to the back of the buffer beam, being there keyed and bolted together, and to smoke-box stay, the upper bar being checked on top for a heavy cross plate laid on flat. All are rigidly secured to the buffer beam and frames by "boxed" angle irons, thus forming an efficient protection to the cylinders in case of collision.

The back ends of the frames are secured by heavy cross-bars checked for and into the upper and lower edges of the frames. These cross-bars carry the drag-box, wedge casting and safety chains for tender, and extend outwards to support the cab back castings. The middle portions of the frame are stayed entirely independent of the boiler, and in such a manner as to prevent any twisting due to superincumbent weight.

The fire-box is spread over the frames and is supported by four cast-steel slippers on top of the frames. The common system of carrying the fire-box by four side links has given trouble by springing the sides and corners of the foundation

ring. Two heavy plates studded on the sides of the outside fire-box and bent under the top bar of the frame, together with two heavy links connecting brackets on the back face of the box to the frame form sufficient security for the boiler in event of derailment, but they carry no weight and admit of free expansion of the boiler.

The grate is rocked in two halves by separate handles on face sheet, and the dump can be worked easily by one hand from the footplate.

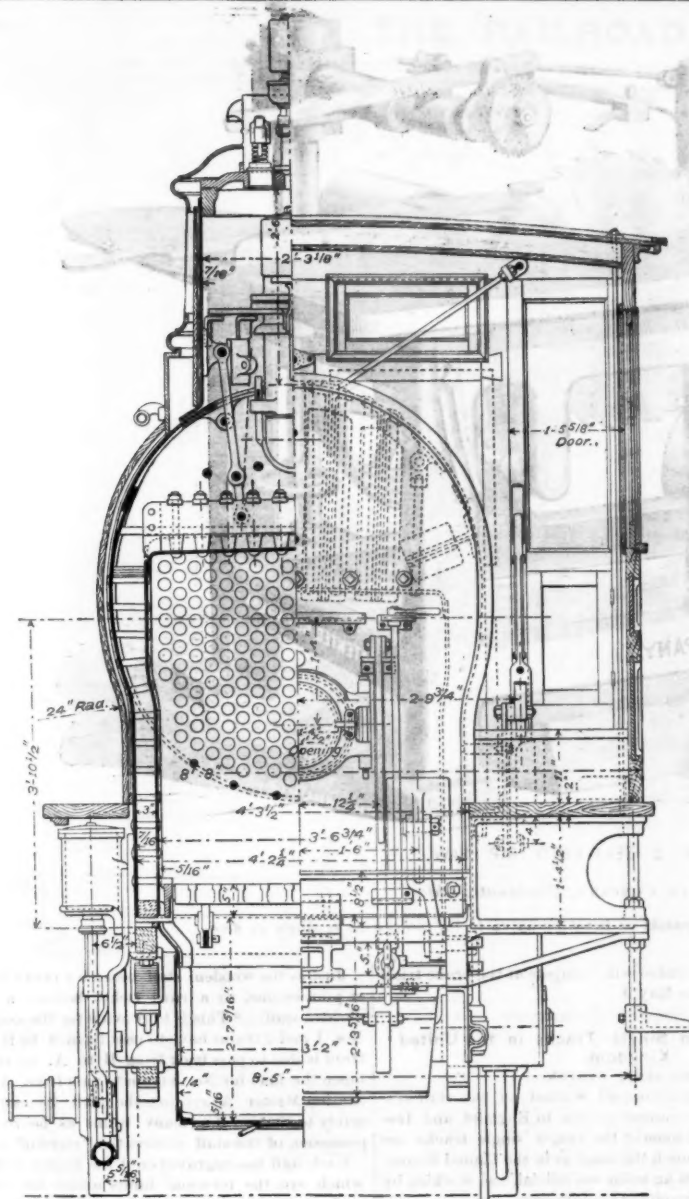
The ash pan is constructed in sections, so as to be easily removed without taking down any other part but the dump shaft, thus enabling any repairs to be made without taking the wheels out. Both ash pan and grate carriers are rigidly secured to foundation ring only, and not to fire-box sheets or frame in any way.

The boiler plates are all Siemens-Martin mild steel of fire-box quality, imported from Scotland, and are sheared, punched and riveted by Tweddell's hydraulic machinery, with steel rivets and stays of extra mild quality. The whole boiler is thus, with the exception of the foundation ring and one or two minor items, of steel of similar quality.

The valves are of the Allen type, with Morse balancing device, and the truck wheels are wrought-iron disks, made by Krupp, with Mansell clip rings and crucible steel tires.

U. S. metallic packing is used for the piston rods and valve stems.

The engine is capable of exerting a tractive force of 155.7 lbs. per lb. pressure on pistons.



CONSOLIDATION LOCOMOTIVE—CANADIAN PACIFIC RAILWAY.

It is equipped with the Westinghouse automatic brake on the two forward pairs of drivers, and with the American steam brake on the two hind pairs, both systems being connected to the tender and intended to be used alternately.

Boiler, dome, cylinders, steam chests and saddle are covered with asbestos cloth $\frac{1}{2}$ in. thick.

Feed water is supplied by two lifting injectors, one No. 8 on right hand and one No. 9 on left.

Sight feed lubricators are used.

The following is a list of the principal dimensions:

CYLINDERS AND MOTION.	
Diameter and stroke.....	19 in. x 22 in.
Distance apart of centres.....	6 ft. 11 in.
Steam ports, length and width.....	18 in. x $1\frac{1}{2}$ in.
Exhaust ".....	18 in. x $2\frac{1}{2}$ in.
Diameter of piston rods.....	9 ft. 2 in.
Length of connecting rod.....	5 in. x $4\frac{1}{2}$ in.
Journal of connecting rod, length and diameter.....	5 in. x $4\frac{1}{2}$ in.
Throat of valve.....	5 in.
Travel of eccentrics.....	5 in.
Lap of valve.....	1 in.
Lead of valve each opening.....	$\frac{1}{8}$ in.
WHEELS AND FRAME.	
Driving wheels, diameter.....	4 ft. 3 in.
" tires, width and thickness.....	5 in. x 3 in., flanged.
1st and 4th.....	6 in. x 3 in., plain.
Driving wheels, tires, width and thickness, 2d, 3d.....	7 in. x 8 in.
Driving axle journals, diameter and length.....	5 in. x 2 in.
Truck wheels, diameter.....	36 in.
" tires, width and thickness.....	5 in. x 2 in.
" axle journals, diameter and length.....	14 ft. 3 in.
Fixed wheel base.....	21 ft. 3 in.
Total wheel base of engine.....	3 in.
Thickness of frames.....	4 ft. 2 in.
Width over frames.....	4 ft. 5 in.
" between tires.....	13 ft. 0 in.
Centre of cylinder to centre of driving axle.....	11 ft. 11 in.
BOILER.	
Length of barrel.....	4 ft. 6 in.
Diameter of smallest course outside.....	$\frac{1}{8}$ in.
Thickness of plates.....	$\frac{1}{8}$ in.
" tube plates.....	$\frac{1}{8}$ in.
Fire-box shell, sides, thickness.....	$\frac{1}{8}$ in.
" back and top, thickness.....	$\frac{1}{8}$ in.
" inside crown, thickness.....	$\frac{1}{8}$ in.
" sides and back, thickness.....	8 ft. 11 in.
" length.....	8 ft. 9 in.
" width, bottom and top, 3 ft. 6 in. and 3 ft. 9 in. outside length.....	4 ft. 2 in.
" width, bottom.....	4 ft. 9 in. and 4 ft. 1 in.
" total depth inside, front and back.....	208
No. of tubes.....	2 in.
External diameter of tubes.....	12 ft. 2 in.
Length between tube plates.....	

Heating surface, tubes.....	1320 sq. ft.
fire-box.....	119 sq. ft.
Total.....	1448 sq. ft.
Grate area.....	28.7 sq. ft.
Weight in working order on truck.....	13,100 lbs.
drivers.....	50,900 lbs.
Total.....	104,000 lbs.
Weight of tender, empty.....	35,000 lbs.
Capacity of tender, coal.....	10 tons.
water.....	

Tender fitted with 33 in. Krupp wrought-iron steel tired wheels.

Operating Expenses.

The following tables give the percentages of various items of expense to the total operating expense. They are the average of two years' actual practice on an inland road operating a good deal more than 3,000 miles. The credit item under engine service is for handling material for construction on "feeders." The credits under car and engine repairs are almost entirely old material sold. Under track repairs the credits for material sold have been deducted from renewals of rails, etc. The credit under rent of cars is, of course, a mileage balance.

Train Service.	
Per cent. of total expense.	Per cent. of total expense.
Conductor's wages.....	3.13
Brakemen's ".....	3.67
Baggage men's ".....	.36
Trainmaster's ".....	.23
Lighting cars.....	.21
Heating ".....	.19
Oiling ".....	.65
Cleaning, etc., cars.....	1.15
Engineers and firemen:	
Road engines.....	6.68
Switch engines.....	1.07
Wipers and round house men.....	2.29
Fuel road engines.....	8.59
" switch ".....	.94
" round house.....	.19
Agents and clerks.....	4.08
Freight laborers.....	1.37
Yard and switchmen.....	3.83
Watch and flagmen.....	.43
Delivering mail.....	.04
Fuel for stations.....	.20
Pumpers and engineers.....	.42
Fuel.....	.19
Oil, tallow and waste.....	.01
Repairs to tools and machinery.....	.36
Repairs to tanks.....	.22

Track Repairs.	
Renewing rails.....	3.02
" ties.....	3.59
Frogs and switches.....	.95
Surfacing.....	4.11
Shoveling snow.....	.64
Wrecking.....	.04
Renewing ballast.....	1.98
Engineering and salaries.....	.27
Total.....	18.50
Bridge Repairs.	
Truss bridges.....	1.09
Pile and trestle.....	1.28
Open drains.....	.01
Culverts.....	.27
Masonry.....	.04
Rip-rap.....	.03
Total.....	4.00
Fence Repairs.	
Wire fence.....	.26
Wooden ".....	.30
snow.....	.03
Total.....	.60
Building Repairs.	
Passenger and freight houses.....	.56
Engine houses.....	.29
Water houses.....	.02
Machine shops.....	.08
Car shops.....	.09
Road department shops.....	.01
Coal chutes.....	.16
Total.....	2.10
Engine Repairs.	
Passenger engines.....	1.48
Freight ".....	5.62
Switching ".....	1.29
Miscellaneous ".....	.02
Tools and machinery.....	0.26
Fuel for shops.....	0.73
Lighting ".....	0.01
Total.....	8.50
Clerks and superintendence.	
Stationery.....	0.09
Repairs on account of accidents.....	0.41
Miscellaneous (credit).....	-1.42
Total.....	0.08
Printing and Advertising.	
Total.....	1.00
General Expenses.	
President, manager's and supt's depts.....	1.92
General passenger and freight departments.....	.14
Accounting department.....	1.60
Total.....	3.66
Engineering and real estate.	
Treasury department.....	.39
Miscellaneous.....	1.96
Total.....	2.35
Legal expenses.	
Miscellaneous expenses.....	.75
Total.....	.75
Foreign Agencies.	
Agents and clerks.....	.97
Rents.....	.09
Traveling men.....	.43
Total.....	1.50
Insurance.	
Rent of cars (credits).....	-.88
Total.....	.62
Car Repairs.	
Passenger cars.....	1.82
Baggage ".....	.54
Postal ".....	.08
Sleeping ".....	.16
Dining ".....	.14
Chair ".....	.07
Way ".....	.49
Box ".....	6.04
Total.....	10.50
Flat cars.	
Officers' ".....	1.06
Tool ".....	.03
Road ".....	.49
Machinery and tools.....	.44
Miscellaneous (credits).....	-.54
Total.....	1.06
Loss and Damage (Freight.)	
Total.....	.25
Miscellaneous Loss and Damage.	
Claim agents.....	.10
Injuries to persons.....	.84
Stock killed.....	.17
Loss and damage—baggage.....	.01
Total.....	1.25
Telegraphing.	
Superintendence.....	.58
Agents and operators.....	1.39
Supplies.....	.02
Office repairs.....	.01
Total.....	2.00
Summary of percentage of expenses to total expense.	
Average.	Average.
Train service.....	9.85
Engine ".....	20.30
Station ".....	11.43
Track repairs.....	18.50
Bridge ".....	4.00
Fence ".....	.60
Building ".....	2.10
Docks and levees.....	.25
Engine repairs.....	8.50
Car ".....	10.50
Loss and damage (freight).....	.25
Total.....	100.00

Improved Self-Feed Rip Saw.

The accompanying illustration represents the No. 2 size of an improved rip saw lately introduced by the Egan Company, of Cincinnati, Ohio, whose illustrated catalogue gives the following detailed description of the machine:

"We have made several new points of advantage and convenience on this machine over those heretofore used, viz: A very reliable, powerful feed, much simplified and with much less machinery—a method of changing from a self-feed to a hand-feed and edger in one moment by loosening one thumb screw—a way of getting at the saw without disturbing the feed works by simply swinging feed-arm out of the way, and a method of feeding a piece so that it is always given a slight lead against the fence, and tracking the feed-saw in such a manner that the cutting blade always takes out the kerf made by the feeder.

"The feeding saw is geared up, and can be lifted instantly out of the feed kerf, so as to stop the feed, and pull out the lumber if necessary.

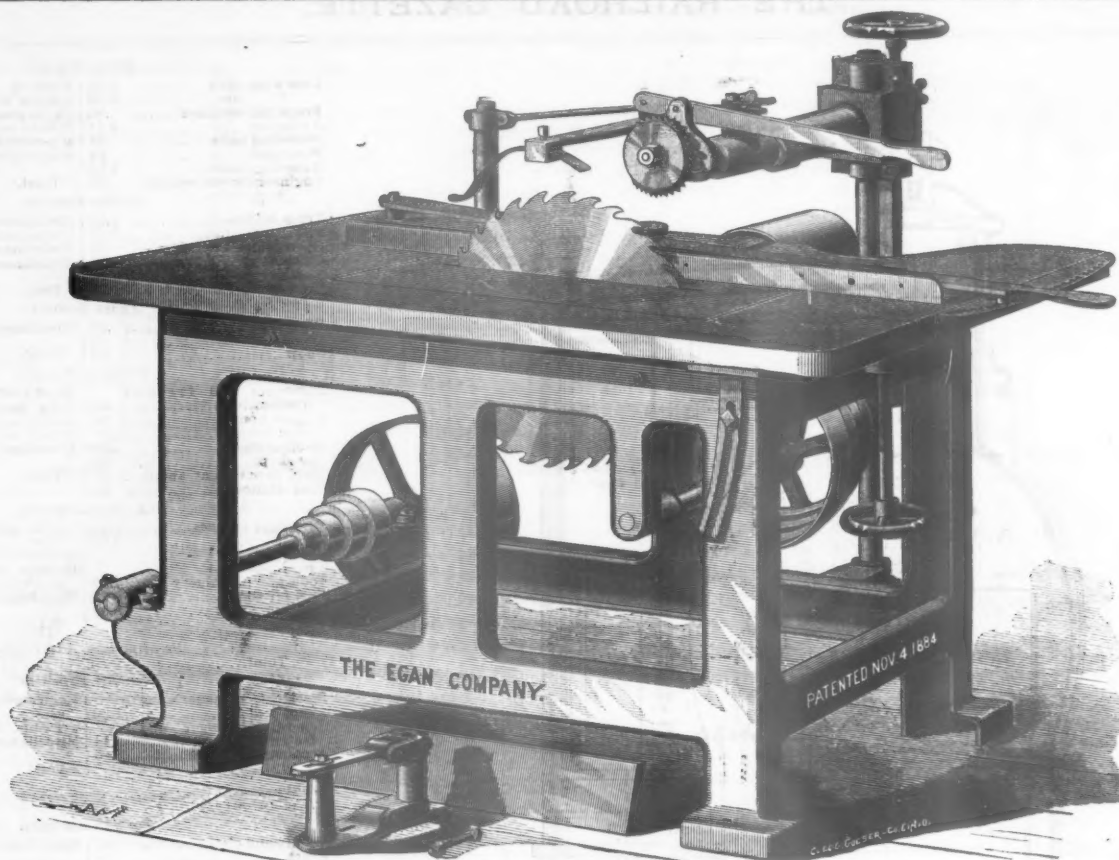
"The frame is cast cored style and is very strong and well braced, and stands very substantially on floor.

"The feed is very powerful, and consists of 4 speeds, 60 ft., 80, 100 and 120 ft. per minute, and it can be quickly changed from one to the other.

"The table is of walnut and cherry, with a thick plate surrounding saw, and is hinged at back end, and (when feed-arm is swung back) can be raised up by the screw or clamp, or can be lifted clear up, giving free access to the mandrel.

"The cast-steel mandrel is extra heavy, and is of best crucible steel, running in self-oiling boxes. The pulley or mandrel is 8 in. diameter and $8\frac{1}{2}$ in. face, and should run 2,000 to 2,500 revolutions per minute, according to size of saw used when ripping. The mandrel is fitted with a substantial outside bearing, which allows very heavy work being done with the greatest ease, and without strain on the machine.

"The patent fence is adjustable from the working end of



IMPROVED NO. 2 SELF-FEED RIP SAW.

Made by the EGAN COMPANY, Cincinnati, Ohio.

The Patent Siding Attachment for Splitting Straight or Bevel Siding up to 7 1/4 inches wide is shown on floor.

machine, so the operator can change instantly from on width of cut to another without loosening any screws.

"This machine will rip any kind of wood, either hard or soft—taking the place of the common rip saw for hand use—and the feed is so powerful that it will do the work of from three to six men, and do it cleaner, with no jerks or resting marks on the cut. Planing mill, furniture, chair, bracket and molding factories, and all parties wanting quick ripping of strips, or ripping of any kind, also as a first-class re-saw, will find it a great labor saver.

"The re-sawing attachment is shown in the cut; it is attached to the regular fence and movable with it, and can be beveled to any angle so as to split straight or bevel siding; and with a 22 in. taper saw, which is used for re-sawing, it will re-saw straight or bevel stuff 7 1/4 in. wide.

"There is no danger of operator getting his fingers cut, and no danger of the board flying back, as the boards are held firmly on each side of cutting saw by a spring. Several saws can be used on mandrel if necessary for sawing ulind slats or work of that class.

"For cuts and prices of this and other wood-working machinery, address the manufacturers, The Egan Company, 202 to 222 W. Front street, Cincinnati, Ohio, U. S. A."

The Carpenter Electric Air Brake.

A private trial was made of this brake on the 27th ult., at Kankakee, Ill., on a train of 30 freight cars. The train was composed of Illinois Central 40,000 lbs. box cars, each car weighing empty about 26,000 lbs. While the power is obtained by air compressed by a pump on the engine, the valves on each car, setting and releasing the brake, are worked by electricity. The wires are led inside the air pipe, and the electric couplings are made by the act of coupling the air hose. The couplings much resemble those used with the Westinghouse brake, and will couple with the Westinghouse coupling, so that cars fitted with the Carpenter brake can be worked with cars and engine fitted with the Westinghouse automatic air brake, and vice versa. The Carpenter pump and arrangement of brake, cylinder, etc., however, differs from the corresponding parts in the Westinghouse brake, the triple valve being dispensed with, and the brake cylinder and auxiliary reservoir combined in one vessel, in which the piston works. The brake piston-rod is fitted with an ingenious arrangement for automatically taking up the slack of the brake-shoes and maintains them at a constant distance from the wheels.

The electric valve virtually consists of a pair of electromagnets and an armature. The latter is attached to a valve on the branch pipe from the main pipe to the cylinder, and the passage of the electric current attracts the armature and lifts the valve, with which it is connected off the seat, allowing the air in the main and branch pipes to escape, thus setting the brakes. The dynamo is carried on the left side on the locomotive.

It is stated that at the trial the instantaneous setting and unsetting of the brakes was perfect. This was the first trial of the invention in America, though it had been previously tested on a train in Germany. The Carpenter air-brake without the electric appliance is widely used in Germany.

The train tried at Kankakee will compete at the brake trials at Burlington, Iowa, on May 9.

Working Trains on Single Tracks in the United Kingdom.

THE STAFF SYSTEM.

The single track lines are not all worked on the staff system, but it is the most common system in England and Ireland, while in Scotland some of the longer single tracks are worked by telegraph, much the same as in the United States, though a "dispatcher" is an unknown official, and working by "time" without a telegraph is also unknown.

The railway mileage of the United Kingdom, Dec. 31, 1885, taken from the government returns, consists of 10,446 double miles and 8,723 single miles; total, 19,169 miles.

The following table shows the number of companies owning short lengths of single lines:

	England. Companies owning.	Ireland. Companies owning.
Number under 5 miles	12	3
" over 5 and under 10 miles	15	3
" over 10 and under 20 miles	22	2
" over 20 and under 30 miles	6	3
" over 30 and under 50 miles	11	4
Scotland, nil.		

Most of these short lengths of single track consist of small independent companies whose lines are entirely single, but this is not the case with all, as some medium-sized double-line companies own a few miles of single track.

The following mileage of single lines is owned by the large double line companies, who possess as feeders a number of single track branch lines. This mileage is only a summary of the total single mileage owned by each company, and does not show the longest unbroken lengths of single line worked.

Railroads having in the Aggregate over 50 Miles of Single Track Line.

England and Wales.			
	Miles.		Miles.
Great Western	1,238	London & South W.	210
Great Eastern	457	Great Northern	175
London & North W.	389	Cambrian	170
Midland	385	London, Brighton & S. C.	130
North Eastern	345	Eastern & Midlands	94
Scotland.			
	Miles.		Miles.
North British	593	Great North. of Scotland	274
Highland	408	Glasgow & S. W.	88
Caledonian	354	Forth & Fife	82
Ireland.			
	Miles.		Miles.
Great Northern	371	Belfast & N. Counties	184
Great Southern & W.	335	Dublin, Wicklow & W.	108
Midland	273	Cork & Brandon	76
Waterford & Limerick	238	Belfast & County Down	68

The staff is practically a symbol to confine the use of a particular track to the passage of one train at a time, and certain rules follow as a sequence, framed to guard against mistakes. The staff was probably at first a stick of wood; now it is often a tube of metal, or a triangular hollow length of metal, or, as in the Tablet system, a disk of metal.

Every station is not necessarily a staff station. There may be a staff simply between two stations, or a staff where there are one or two intermediate stations between the two staff stations. Sometimes a staff controls six miles of track, and sometimes ten or twelve miles.

Just as the wooden staff became a proxy for the pilotman or pilot-engine, so a card ticket became a proxy for the wooden staff. *This is to provide for the contingency when Nos. 1 and 2 trains have to pass from A to B before another train is due to pass back from B to A, to return the staff (open the line) for No. 3 train to pass from A to B. While Station Master A retains the staff he can send forward safely to Station B as many trains as he requires, because possession of the staff confers the "right of road."

Each staff has engraved on it the names of the two stations which are the terminal limits under its control—at each staff station there are necessarily two staffs, one for the section going east and the other for the section going west—there creeps in the danger of the one staff being substituted for the other, hence the staffs are varied in color and form, red, white or blue, round, square or triangular. The boxes also in which the staff-tickets are kept correspond in color with staff, and so do the staff-tickets.

Each staff at a station is kept in the station master's office on two brackets over a small box. In this box are kept the staff-tickets for use. The box is, or should be, kept locked by the inside spring. By inserting the staff in an opening of the box the spring can be drawn back, the box can then be opened and a staff-ticket taken out. Only the staff acting as a key can legitimately open the staff-ticket box, and when the staff is away no staff-ticket is legitimately obtainable. Tickets in stock are kept locked up elsewhere, and no spare staff-tickets are allowed to be kicking about the office.

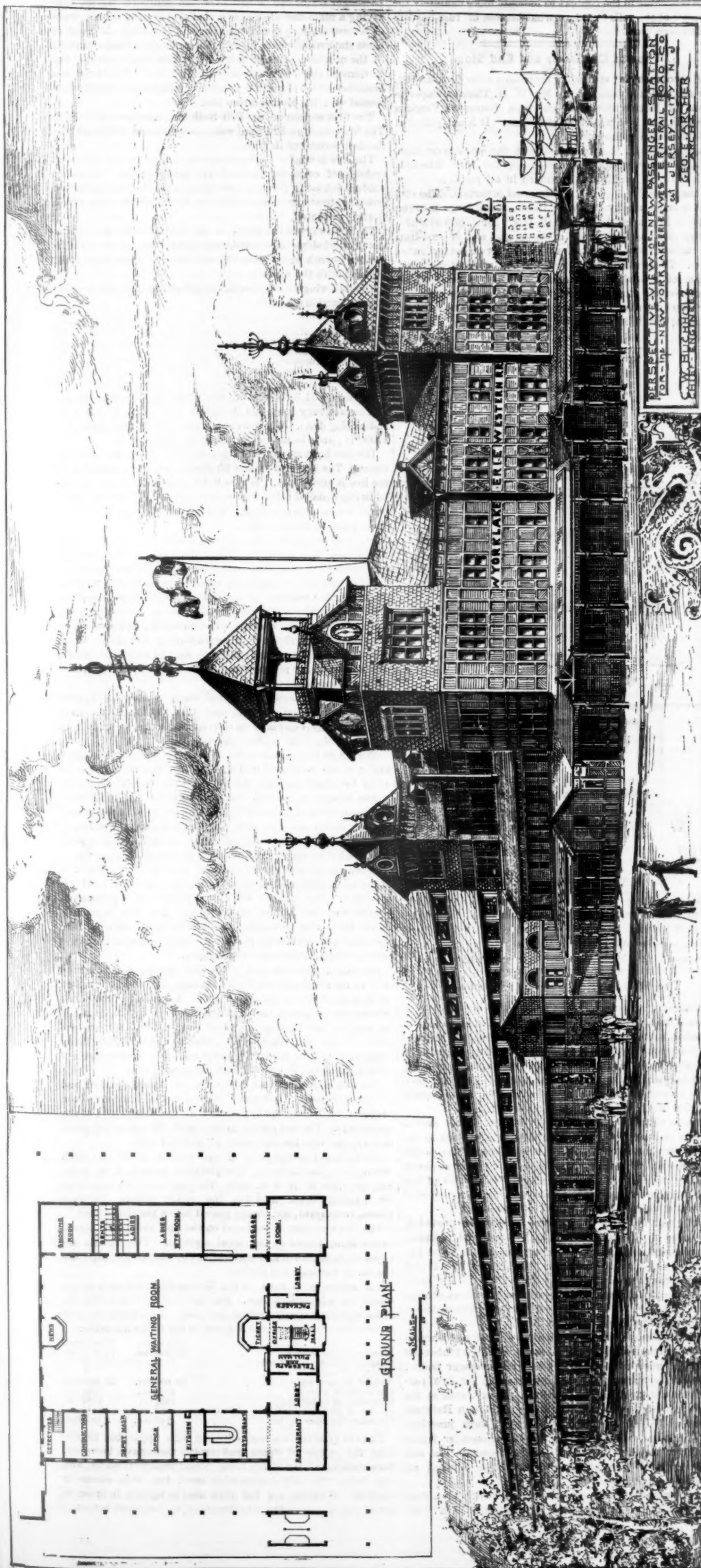
The Liability of the Station Master or Person in charge of a Staff-Station.

1. That it is his personal and responsible duty to control the movements of trains, and that the lives of the passengers may be sacrificed by any carelessness or neglect on his part.
2. That it is his duty to personally hand to the engine driver (or, as the rule may be, to the guard) the staff or staff-ticket, which is the lawful symbol given the driver to proceed with his train on the single track.
3. That no engine or train leaves his station, when it is a staff station, without the staff or staff-ticket.
4. That having once parted with the staff he must on no account issue a staff-ticket for a train or engine to go forward.
5. That when special trains not on time-table are run, the preceding train carries a tail signal board or light to warn all signalmen and trackmen.
6. That when a second engine is in the front part of a train, the leading engine gets the staff or ticket.
7. That when one engine is in front of the train, the sec-

*Train Staff-Ticket.

No. Railway.
..... Line or Branch.
Train No. Down.
To the Engine Driver.—You are authorized, after seeing the Train Staff for the section, to proceed from to and the Train Staff will follow.
Signature of person in charge

Date Back of Ticket.
This ticket must be given up by the engine driver immediately on arrival to the person in charge of the station to which he is authorized to proceed, to be dealt with as the latter may be instructed by the Traffic Manager.



ond engine pushing behind, the driver of the first engine gets a staff-ticket, the second driver the staff. That is, if it is intended for the second engine to go the full length of the section and the staff is to be transferred. If the staff has not to be transferred, he must see that both engines get staff-tickets and the end engine is coupled to the train.

8. That when two engines proceed with a train, one in front and one behind, if the engine pushing behind is only plotting the train over part of the length of the section, he must see that the engineman of the pushing engine carries the staff, and the engineman of the front engine carries a staff-ticket.

The Liability of the Guard.

1. That his train does not leave a staff station without the staff.

2. That he accepts the staff or ticket only from the hand of the person in charge of the station.

3. That before accepting and giving to the driver a staff or ticket to start his train, he sees that the staff itself is in the possession of the person in charge of the station who gives the ticket.

The Liability of the Engine Driver.

1. That he does not leave a staff station without getting the staff or ticket.

2. That he accepts the staff or ticket only from the hand of the chief guard in charge of his train (on some lines, however the staff is given to the driver by the person in charge).

3. That he places the staff in the socket on his engine provided for the purpose.

4. That before accepting a staff-ticket to start he sees the staff itself in the possession of the person in charge of the station.

5. That he does not carry a staff or ticket beyond the staff station to which it belongs, nor gives it out at a station short of the terminal staff station.

6. That he gets the right staff belonging to the section that he is going to run over.

The Liability of the Signalman.

1. That he keeps the signals at danger, and only lowers them to let in one train to the station at a time. When two trains from opposite sides arrive together one train must have come to a stand inside the station before the signals are lowered for the other train.

Provision for Cases of Accident.

In the event of an engine which carries the staff breaking down between two stations, the fireman must take the staff to the staff station in the direction whence assistance can be obtained or is expected, in order that the staff may be at the station on arrival of the engine. Should the engine that fails be in possession of a ticket instead of the staff, assistance must only come from the station at which the staff has been left. But if assistance can be more readily obtained at a station other than that where the staff is, immediate steps must be taken to have the staff transferred to the other end of the section—the fireman must accompany the assistant engine to the place where he left his own engine. Should the accident be of such a nature as to block the road, and the traffic is likely to be stopped for any considerable time, special arrangements must be made for working the trains to and from the points of obstruction on each side. The Train Staff Regulations must be carried out on that side where the staff is at the moment of the accident, and on the other side the traffic must be conducted by a pilotman to be appointed by an order in writing, and the person in charge of each end of the section worked by the pilotman must have a copy of such order.

When the line is again clear no train or engine must be allowed to pass the point of obstruction without the staff and the pilotman—the pilotman must accompany the train or engine carrying the staff to the staff terminal station, when the traffic will be again conducted according to the train staff regulations.

When a ballast train has to work on the line, the staff must be given to the engine driver in charge of it. This will close the line whilst the ballast train is at work. The ballast train must proceed afterwards to one of the staff stations to open the line, before the ordinary traffic can be resumed.

The working time table contains the necessary information as to which are staff stations.

The opinion of railway men is that the staff system is the safest, consequently it is the one most in use. The telegraph system of working, like unto the American, is in use on a few lines in Scotland, and one in Cornwall. Long single lines, however, are in this country considered as only makeshifts until traffic develops sufficiently to either completely double a line or to put in long pieces of second track about midway where trains "correspond." Hence little or no attempt is made by officers to devise any new system of working single lines. There has been for years comparatively a "rest" at the staff system. The tablet system is merely an extension of the staff system, and at present is looked upon as experimental. The feeling of railway officers is that single lines, under any plan of working, are dangerous; that new plans, as it were, multiply wheels, and have a tendency to breed confusion; and that, as a choice of evils, the staff system is the safest.

E. B. IVATTS.

The Jersey City Depot of the Erie.

The accompanying cut shows this important structure in perspective, and a ground plan of the main building or "head-house." The main building has a frontage of 137 ft. on Pavonia avenue and a river front of 120 ft. exclusive of the 24-ft. awnings on their sides. The train shed is 140 ft. by 600 ft. The tower at the southeast corner is to be about 115 ft. high, including the finial of 15 ft. The main structure will be about 60 ft. high. The disposition of waiting room

and other rooms on the ground floor is shown on the plan. On the second floor are to be the offices of the operating department, and on the third floor offices for the car record clerks.

The foundations of the head-house are of hard brick, laid in Portland cement, coped with North River sandstone. The brickwork rests on 525 piles, 55 ft. long. The site of the new building is full of old piles and cribs, which have, in their turn, supported different structures. These form, with the new piles driven among them, a very solid mass, preventing any outward sliding on the deep mud of the river. To avoid overloading, however, this part of the structure is almost wholly built of wood; the train-shed is of wrought-iron, sheathed with wood and galvanized iron.

The extension of the building is to be finished with "novelty" siding, shingles, panels, etc., painted in parti color to accentuate the details. The finials are iron and copper gilded. The tower clock will have six-foot dials, lighted from within by electric light. The interior will be in hard wood, in natural colors. The floors of the vestibules and toilet rooms will be of maple. The main waiting room is 66 ft. by 100 ft., and 50 ft. high in the clear, and lighted by stained glass windows in the clear-story. A gallery runs around three sides of the waiting room at the level of the second story, and from this various offices open off.

There will be a ferry ticket-office at the southeastern corner of the building for the use of Jersey City passengers only. As at the Jersey City depot of the Pennsylvania, passengers from the trains will go on board their boats without passing through the ferry wickets. It is to be regretted that in neither of these fine depots has it been found practicable to pass the suburban traffic directly to the trains without going through the waiting room.

The building is to be lighted throughout by electricity and heated with steam by about 60 Bundy radiators.

The cost of passenger station, train-shed, and the iron shed to connect the station with the ferry-house will be over \$200,000. The train-shed was built by the Phoenix Bridge Co., and Messrs. Cofrode & Saylor are building the passenger house. The drawings and specifications were made by Mr. Geo. E. Archer, the company's architect, and the work is executed under the supervision of Mr. C. W. Buchholz, Engineer of Bridges and Buildings, and Mr. J. W. Ferguson, Assistant Engineer.

Life of Rails.

From the *Revue Générale des Chemins de Fer* we reproduce the following tables of the results of observation on the wear of rails made on two experimental sections of the Cologne-Minden line. The *Revue* gives the *Organ for Railroad Progress* credit for the data:

	Rails put down October, 1864, number.	Percentage of renewals.		
		After 12 years.	After 15 years.	After 18 years.
Steele iron, Frederick William Works, Troisdorf.	150	80.66	82.00	86.00
Case-hardened iron, Phoenix Works, Ruhrort.	150	68.00	74.00	74.00
Bessemer steel, Hoersch & Son.	148	4.70	6.64	17.45
Bessemer steel, Krupp.	147	4.08	6.08	9.52
Bessemer steel, Société des Forges & Mines, Hoerde.	150	1.31	2.00	5.35

Steel rails renewed since 1868 on the Cologne-Minden Line.

Year.	Number of rails in service, each 6.50 metres long.	Number of rails renewed.				Percentage of all.
		Broken transverse.	Broken through bolts.	Deflection in service.	Total.	
1869	21,897	20	3	8	31	0.142
1870	78,250	12	2	9	23	0.025
1871	139,618	34	2	14	50	0.036
1872	222,844	57	11	25	93	0.042
1873	347,900	212	41	89	342	0.101
1874	452,050	460	86	192	738	0.158
1875	504,634	216	41	90	347	0.069
1876	514,801	191	37	80	310	0.060
1877	537,908	166	47	166	319	0.060
1878	548,717	155	41	201	397	0.070
1879	561,064	92	96	267	455	0.077
1880	574,564	121	110	389	620	0.102
1881	584,288	125	92	297	514	0.084
1882-83	594,964	148	105	432	685	0.110
1883-84	613,085	150	76	544	770	0.116
1884-85	624,351	108	83	678	869	0.132
1885-86	632,066	150	92	616	838	0.121
		2,339	969	4,094	7,402	1.123

* Abnormal renewals due to bad fittings.

	Decrease in height of rails—millimeters.			
	Double track, grade 1 in 1040, curve of 1,500 metres radius. West section.		Double track, grade 1 in 1570, straight line. East section.	
	12 years.	15 years.	12 years.	15 years.
Steele iron	4.31	5.01	5.73	5.93
Case-hardened iron	4.44	5.89	7.67	9.31
Bessemer steel, Hoersch	5.23	7.12	7.73	8.81
" " Krupp	5.18	6.33	7.14	8.37
" " Hoerde	4.18	6.33	6.80	7.97

	Decrease in height of rails per million tons of traffic—millimeters.	
	West section.	East section.
Steele iron	0.009	0.083
Case-hardened iron	0.18	0.099
Bessemer steel, Hoersch	0.13	0.14
" " Krupp	0.12	0.13
" " Hoerde	0.12	0.12

The expressions steele iron and case-hardened iron are used

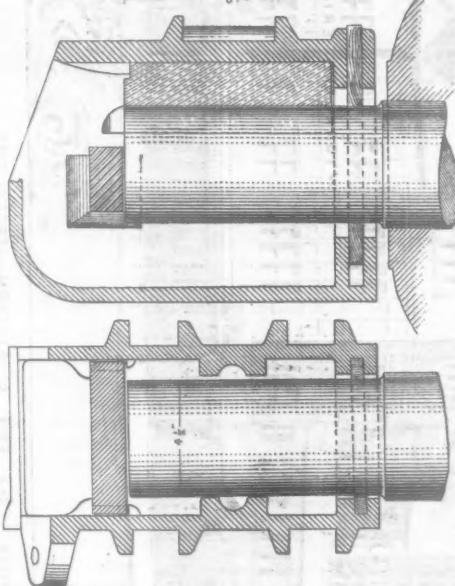
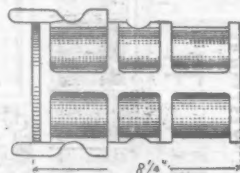
as equivalents for "fer à grain fin" and "fer cémenté." There is nothing in the context to indicate more definitely the character of the rails tested, or what process of case-hardening had been used.

Thomas Car Brass and End Stop.

The accompanying engraving represents a car journal-box, brass and end-stop designed by Mr. W. H. Thomas, Superintendent of Motive Power of the East Tennessee, Virginia & Georgia, and is in use upon that line. It is not patented and is dedicated to the public.

The box is M. C. B. standard, except the pockets or lugs, shown in drawing, upon the inside of the box. The axle used is M. C. B. length and standard in all respects, except that the journal is $4\frac{1}{2}$ in. \times $8\frac{3}{4}$ in., and collarless. The end thrust is taken up by the stop block, which drops into the pockets or lugs upon the sides of the box. Mr. Thomas states that this stop has been made of brass and also of cast-iron with chilled faces, and that both have given perfect satisfaction. The brass fits the top of the box without the interpolation of a wedge, and has lugs at front and end which project over the stop block and prevent its jumping out.

The top of brass is cut away, as shown in drawing, to lighten it; but ribs remain to give the necessary bearing



The Thomas Car Brass and End Stop.

upon the top of the box. Should the brass, axle or wheel give out anywhere, any M. C. B. axle or brass and wedge would fit it without trouble. The device is being used on passenger equipment and engine tenders with perfect satisfaction, and is now being extended to freight equipment.

The Metropolitan Railway of Berlin.

The following account of one of the most recent metropolitan lines is taken from a pamphlet by MM. Paul Gaudin and Jean Zuber. At the present time, when additional railroad facilities are much required in New York and many projects, both for elevated and underground railroads, are being brought forward, a description of a railroad that has been found to do well in Berlin, a city of almost the same population as New York, cannot fail to be interesting.

The line is elevated above the level of the streets and is worked by ordinary locomotives, and so far and only so far resembles the elevated railroads of New York. The points of difference are numerous. The engines are nearly as heavy as ordinary main line engines, and the trains seat about 500 passengers, or more than twice as many as can be conveyed in comfort on a train on the New York elevated.

Smoking cars and cars of different classes are provided, and the rates of fare vary according to class and distance. Four tracks are used, permitting numerous through and express trains to be run. Passengers arriving at the Trunk line termini can step into a Metropolitan train in the same station, and can be conveyed to any suburb without change of cars. Baggage can be checked at the principal stations, and is conveyed by many of the trains.

The Metropolitan Railway runs east and west right across the busiest portion of Berlin, and is an elevated four-track railroad $7\frac{1}{2}$ miles long, solely devoted to passenger traffic. The two northern tracks are used for suburban or local passenger trains, stopping at all stations. These tracks at the eastern and western ends of the line (the Silesian Railroad terminus and Charlottenburg respectively) form junctions with the Belt line running round Berlin. Passenger trains are run from the Belt line over the Metropolitan line and vice versa, giving a complete communication between all parts of the city and suburbs.

The two southern tracks are used for express trains, stopping only at the principal stations. These tracks form junctions

with most of the trunk lines, and consequently trunk line passenger trains can be run over the southern tracks, thus giving a main-line passenger a choice of getting off his train at several stations in different parts of the city. If none of these stations suit him, he can change into the trains running on the northern track, which will convey him to any of the stations on the Metropolitan or the Belt line. The latter has branches which reach the trunk line termini not directly connected with the Metropolitan line.

The first section of the Belt Railroad was opened in 1872. The Metropolitan Railroad was commenced in 1875 and was finished throughout in 1882.

The line is wholly elevated and the lengths of the different systems of construction used are given below. The brick viaduct is used in going across blocks and the iron bridges in crossing streets, and in crossing the Spree, the river on which Berlin is situated.

The archways in the viaducts are let out at good rents as stores, workshops, and ware-houses and chimneys are built in the brick-work piers. Several new streets have been built parallel with the viaduct.

The following table gives the length of the different systems of construction adopted:

	Length, Miles.
Brick viaduct	4.95
Iron bridges and viaducts	1.13
Walled embankments	.42
Earth embankments	1.05
Total	7.55

The line is 51.3 ft. wide in the clear for the four tracks. The curves vary from 894 ft. radius ($6\frac{1}{2}$ deg.) to 1,604 ft. radius ($3\frac{1}{2}$ deg.). The heaviest grade is 42 ft. per mile for 1,200 ft., and the major portion of the line is level.

The line has four large bridges, three of which are over the Spree. The line also crosses 65 streets, but the remainder of the line is across lots. Where light is important, two parallel bridges placed a few feet apart are used, so that the light passes freely between them. Most of the bridges are either iron arches or plate girders.

The rails weigh 58 $\frac{1}{2}$ lbs. per yard and are $4\frac{3}{4}$ in. high, $3\frac{3}{8}$ in. base, $2\frac{1}{2}$ in. width of head, and rest on longitudinal iron sleepers $12\frac{1}{2}$ in. wide and $\frac{1}{2}$ in. thick. The fastening is peculiar and can be inspected, removed or tightened without disturbing the ballast. It consists of clips on each side of the rail, tightened by a horizontal bolt passing underneath the rail and through the sleeper. The fastening appears to be very secure and efficient. These fastenings are placed 50 in. apart. Both sleepers and rails are fish-plated at the joints. Transverse angles placed every 12 ft. in—two per sleeper—maintain the gauge of the rails.

This system of iron longitudinal sleepers does not appear to give complete satisfaction, and it is stated that the rails sink unequally, especially on curves, while the wear is considerable where the traffic is heavy.

The whole line is ballasted. The upper soffits of the brick and stone arches are covered with asphalt, and the water is led away by drains through the piers. On the iron bridges the whole bridge is covered with rectangular plates of iron, which are arched inversely; these support a thick bed of ballast, on which the ties and rails are placed in the ordinary manner. The water runs off freely at the bottom of each arch, and if necessary arise the rails can be easily removed.

There are ten stations on the line; five are for the service of the main lines and for local traffic, the others for local service only. The stations are all remarkably well planned as regards the convenience of travelers. The line being elevated, there are necessarily two stories to the stations. On the lower one, level with the street, are to be found the ticket offices, waiting rooms and restaurants.

Baggage is not conveyed by the local trains; it is admitted only at the large stations from the main line, and it is raised by hydraulic lifts to the upper level. A passenger can check his baggage to any of the principal hotels in Berlin, or it can be sent to any destination from thence. The stations are built of brick of different colors, granite and sandstone being employed only for decorative purposes. The framework, of very light metal, is covered with corrugated iron.

The two largest stations are those of Alexanderplatz and Friedrichstrasse. The former station has a handsome iron arched roof, 123 ft. span, pivoted at the centre and at the springings. The bed-plates upon which the springing pivot rest are tied into the masonry by inclined bolts.

The station has four lines of rail and two platforms, each serving two lines of rails. One platform is 34 ft. 6 in. wide, and the other 37 ft. 9 in. wide. The platforms are supported by vaulted brick arching, the ticket offices, baggage rooms, restaurant, etc., being placed below the street level.

The block system is employed on the line, the block signal cabins being placed at the local stations. The signals are given by semaphores and transmitted by electricity, after the system of Siemens and Halske.

The locomotives used on the Metropolitan are such as are found on all German lines. For the local service tender engines with four coupled wheels are used. Two kinds are now in use; the chief features are given in the following table:

	Old type.	New type.
Weight of the engine	88,000 lbs.	78,000 lbs.
Number of coupled wheels	4	4
Number of axles	3	3
Weight on each axle	29,400 lbs.	25,500 lbs.
Diameter of wheels	63 $\frac{1}{2}$ in.	52 $\frac{1}{2}$ in.
Diameter of cylinders	14 $\frac{1}{2}$ in.	13 $\frac{1}{2}$ in.
Stroke of piston	23 in.	21 $\frac{1}{2}$ in.
Pressure, lbs. per sq. in.	147 lbs.	147 lbs.

The old type engines were supplied with apparatus to prevent the escape of steam and smoke; these have, however, been suppressed, the steam being found unobjectionable, and coke being the only combustible used, but little smoke is emitted. Whistles are but little used as signals, in order to avoid annoyance to the inhabitants of the adjacent houses.

The local trains are composed of second and third class carriages; they are of lighter construction than those of the main lines. There are two separate and distinct services under different administrations—(1) The Metropolitan and Belt line trains, which run over the two northern lines of the Metropolitan. (2) The main line and suburban trains which run over the southern lines of the viaduct. The speed is limited to 28 miles an hour. The stoppages are from 10 to 30 seconds. The trains run every ten minutes, in the morning and evening, and on Sundays and holidays every five; this is the maximum schedule. The present service consists of 280 regular trains and 72 occasional—total, 352.

The main line and suburban trains only stop at the large stations of the Metropolitan; they are limited to the same speed, and only resume their higher rates of velocity on quitting the city. The number of these trains which run over the line is 112 per day in the winter months; they all carry baggage and have four classes. These trains are, for the most part, postal; the postal service in Germany is of considerable importance, as packages are sent to all parts of the empire without limit as to size or weight. Freight trains do not pass over the Metropolitan Viaduct, but run on the Belt line.

The population of Berlin by the last census, taken in 1885, was 1,315,547, the increase being at the rate of 3 per cent. per annum. The local traffic is 25,000 to 30,000 passengers per day. The numbers during the last four years have been: In 1882, 8,524,348; 1883, 10,116,826; 1884, 9,157,762; 1885, 10,196,028. An exhibition, which took place at Berlin in 1883, accounts for the large numbers in that year. The third-class prices are 5 cents between each station, and 10 cents for the length of the whole line; second-class tickets are 5c. higher.* Workmen's season tickets are issued at a lower rate, but must be used before 8 a. m., or after 4 p. m.

The relative density of the traffic, as compared with that of other metropolitan railway lines, may be stated as under, the comparison, of course, being based on the assumption that the length of the average journey is the same in all cases:

	No. Passengers per mile per annum.
Manhattan, whole line.....	3,532,000
Sixth and Third Aves. only.....	4,215,000
Berlin.....	1,360,000
London Underground, inner circle, estimated.....	8,000,000
Metropolitan (London) whole line.....	2,879,000
District.....	2,250,000
North London.....	2,080,000
Average all lines, England and Wales.....	52,000
Average all lines, U. S. (excluding elevated).....	2,854

The enormous difference in the density of traffic on Metropolitan as compared with ordinary railroads is clearly shown in this table. It will be seen that the Berlin railroad has not nearly such heavy traffic as the Manhattan. This is probably due to several causes, one of the most important being the difference in the habits of the people, the North German being fond of walking and seldom in a New York hurry. The higher fares on the Berlin line, and the shape of the city, which in New York concentrates so much travel in the direction of the length of Manhattan Island, are also features which contribute to the difference in density of travel. The Metropolitan and District railroads, London, though at first intended to be solely underground lines, have been extended into country districts beyond the suburbs, and hence their average traffic over their whole length is less dense per mile than on the original underground portion, the "Inner Circle." On that the trains are about as frequent as on the New York Elevated, and as each train conveys more than double the number of passengers, the traffic is correspondingly heavier. The traffic on the Berlin Elevated is increasing annually, and will probably make a better showing when the line has been open as long as the corresponding lines in London and New York.

The Berlin Metropolitan line was made by the state. The cost was as follows:

Purchase of property.....	\$3,365,000
Construction.....	9,478,000
Total.....	12,843,000
Less sale of land not utilized.....	1,901,000
Cost per mile.....	15,944,000
Annual receipts:	

Local lines.....	760,000
Through lines.....	Not given separately.
Working expenses.....	855,000

The first considerations which led to the creation of the Berlin Metropolitan Railway were chiefly strategic, as it was considered of the highest importance that troops could be promptly massed at Berlin or passed through en route to either the French, Russian, Austrian or Danish frontier as might be required. The line therefore was installed at greater expense than would otherwise have been necessary, but the advantages gained by the civil inhabitants of Berlin have been very great. The facilities given have induced many to quit the city for the suburbs, where they are better and more cheaply housed. The construction of the line has therefore been a wise measure, and though the profit is not yet large enough to pay the whole interest of the sum spent on construction, the gradual growth of traffic will ere long enable this end to be attained.

Profit Sharing on the Toledo, Ann Arbor & Northern Michigan.

By authority of the Board of Directors the proposition to pay all employees of the company (in addition to their regular wages) a dividend, as if they were stockholders, was submitted to the stockholders at their regular annual meeting.

* In Germany fourth class passenger cars, in point of comfort, may be compared to emigrant or summer excursion cars. Third class cars are equal to so-called, but inferior, first class cars here, while second class cars are most comfortably upholstered, and are equivalent to our parlor cars. First class carriages are little used in Germany, and practically serve the purpose of private cars here.—EDITOR R. G.

April 20, 1887, and was unanimously adopted. The plan is as follows:

The Toledo, Ann Arbor & North Michigan Railway Company hereby stipulates and agrees to pay to each of its officers (except its President), and to all its employees, a dividend, as provided in the terms and conditions following:

All officials and employees of said company who shall have been continuously in its service for five years or more shall, in addition to the regular wages paid to each, receive an amount which shall equal the proportion hereinafter named of such dividends on its capital stock as may be declared by the board of directors of this company in any year.

The basis on which a proportion of the dividends earned by this company are to be paid to each officer and employee shall be as follows:

The board of directors, when declaring a dividend, shall add to the total amount of capital stock outstanding, the gross sum paid by the company, in salaries and wages, for the preceding year, to all its employees and officials (except its President), who shall have been continuously in the service for the five years next preceding the declaration of such dividends, and each of such officers and employees shall be entitled to receive in any year in which a dividend shall be declared, a dividend on an amount equal to his salary for the year preceding, as if he were the owner of a number of shares of the capital stock of the company to a like amount, at their par value.

Every officer and employee, who shall have been in the service of the company continuously for twenty years or more, and voluntarily retires from its service with an honorable discharge, shall be entitled to receive, and have delivered to him, a certificate of the full paid up capital stock of the company, which shall equal in amount at its par value the total sum paid him as wages for the last year he was in the service of the company.

If any officer or employee of the company, as aforesaid, shall be so disabled, while in the line of active duty, as to be unable to resume his place for a period of six months or more, he shall be entitled to receive a certificate of the full paid up capital stock of the company, which shall equal in amount, at its par value, the gross sum paid him for the year immediately preceding his said disability. And if any officer or employee shall lose his life while in the line of active duty, his wife, if he has one, and if not, his legal representatives, shall be entitled to receive a certificate of the full paid up capital stock of the company which shall equal in amount at its par value, 5 times the gross sum paid him for the year next preceding his death. Provided, however, that this rule shall not apply in cases where a claim for damages is made in the courts.

It is not the purpose in this plan of allotment and profit sharing to make a gift to the officers and employees of the company, without value received. It is not intended to take from the dividends due the shareholders, and arbitrarily add to the wages of the employees without an equivalent. The bonus which it is proposed to pay to each officer and employee is to be paid out of the additional earnings and savings of the company, which savings and earnings it is believed will be materially increased by the activity, economy and fidelity of officials and employees alike, and by a watchfulness which must result in decreasing accidents, and in securing a better understanding of the responsibilities and duties of each, as also a more perfect co-operation between all who are in the service of the company.

It will be observed that in this plan for paying dividends, the officers and employees run no risk of pecuniary loss. They do not own the stock and cannot be held for damages, but each will receive a dividend when earned by the company, as if he were the owner of stock. The wages of each is guaranteed and paid by the company, and must be paid, even when the company is losing money. It will be seen by this simple statement that capital must run the risk of all losses, and pay all wages and daily expenses, whether earned by the company or not.

It is proposed to make four periods of five years each (or 20 years) as the maximum period of service, and require a period of five years continuous service as a condition to securing a proportion of the profits earned by the company. And it is also proposed for the consideration of the board of directors, whether, in the near future, it may not be desirable and equitable to grant in addition to the dividends and stock allotment provided, an increase in the wages paid each officer and employee who may have remained in the service of the company for two or more periods of five years each, and especially for the fourth period, which completes the 20 years continuous service, at which time it is suggested stipulation ought to be made, that any of such employees could then voluntarily retire or be retired by the company, each person so retired or voluntarily retiring to receive from the company the amount of paid up capital stock, as hereinbefore provided.

In addition to the plan of profit sharing as herein proposed and an increase in compensation for a continuous service of ten years or more as recommended, it is suggested that in lieu of any claim against the company for damages because of accidents, a fund for accident and life insurance be provided at an early day, in such manner as shall seem to the board of directors just and equitable, and providing also that all promotions, so far as practicable, shall be made from among the officials and employees longest in the service of the company.

TECHNICAL.

South American Railroads.

In a report made by U. S. Consul-General Hanna, of Buenos Ayres, in the Argentine Republic, there is contained the following information about new railroads in that country:

"Vast railroad charters have been sanctioned by the present Congress, notably among them those granted to the Buenos Ayres & Pacific and the Transcontinental Railway companies, the former 1,200 miles in length, and the latter 1,500 miles in length. The Buenos Ayres & Pacific line, on the thirty-fourth parallel, now completed and operated to Mendoza, runs through the Uspallate Pass and terminates at Valparaiso, in Chili. The Transcontinental road is to be constructed on the thirty-eighth parallel. It is already built and in operation from Buenos Ayres to Bahia Blanca, on the Atlantic, and from there runs westward to Talcahuano, crossing the mountains, by the Colorado Pass, to Antuco, on the Pacific slope. Both of these roads are to be constructed with English capital, upon an agreed basis of cost per mile, with a guarantee of 6 per cent. on the part of the Argentine Government, covering a period of twenty years.

"Little or no American capital has hitherto found its way here, though the recent organization in New York of a reputable and powerful syndicate, with \$20,000,000 capital, gives assurance that our people are now ready to compete in the field for the rich results, hitherto unchallenged, borne off by European corporations."

The Darjeeling Railway.

This remarkable little line of 2 ft. gauge climbs the lower slopes of the Himalayas and connects the great plain of Bengal with the mountain sanitarium, Darjeeling. The line rises 6919 ft. in 40½ miles, an average rise of nearly 172 ft.

per mile. In this distance 16¼ miles are on a continuous average grade of 182 ft. per mile. As originally laid out, 12 miles of the road (much of which followed a highway) was laid out with grades of 264 ft. per mile and curves of 43 ft. radius, but the worst gradient is now 188 ft. per mile, and with four exceptions, the worst curves are now 70 ft. radius. The cost of the whole line, 51 miles long, has been 2,800,000 rupees, which, at the present rate of exchange, is about equal to \$19,100 per mile. As this includes rolling stock, and 44 miles of the whole line are in the mountains, this figure is very moderate. The last dividend paid was at the rate of 17 per cent. per annum.

The locomotives have 10 in. x 14 in. cylinders and weigh 24,600 lbs. in working order, with tank containing 390 gallons of water. It is proposed to use twin engines, coupled back to back. The freight cars weigh 2,000 lbs. and carry 8,000 lbs. The passenger cars vary in weight from 900 lbs. to 2,400 lbs., the diameter of the wheels being 18 in.

The line has four loops or spirals and five reverses or switchbacks. The maximum super-elevation of the outer rail is 2¼ in. The traffic for over five years was worked round a curve of 42.6 ft. radius, extending over more than a half circle, on a gradient of 165 ft. per mile.

Such a combination of narrow gauge, steep gradients, sharp curves, small cars and big dividends is probably unique, and does great credit to the engineer, Mr. Prestage, and those who assisted him in this enterprise.

American Society of Civil Engineers.

The following circulars are issued by a committee of the Society:

The Convention of 1887 will be held at the Hotel Kaaterskill, New York, beginning about July 2, 1887. The Kaaterskill is one of the largest hotels in the United States. It overlooks many miles of the course of the Hudson River. It is reached directly by rail from Rondout and Kingston, and also by rail from Catskill to the foot of the mountain, and thence by carriage to the hotel.

It is contemplated that all those intending to be at the Convention should, if possible, meet in New York City, and leave by steamboat on the morning of the day previous to the opening of the Convention. The trip up the Hudson will be one of the features of this occasion. A stop will probably be made at West Point, and the works at the bridge over the Hudson at Poughkeepsie will be visited and inspected. The masonry and foundation of the piers and the superstructure of this bridge are in progress.

The Convention will continue at the hotel several days, including the Fourth of July. Arrangements are contemplated for a visit to the Cement Rock Mines and the Cement Works of the Rondout Valley (Rosendale), which are near the Kaaterskill.

The rate at the hotel will be \$3 per day. Ample accommodations are assured.

The details of arrangements for the Convention, and for transit to and from the place, will be announced in a future circular.

Members are invited to discuss the subjects presented by the papers which have been published in the transactions since the last convention. In addition to the papers already issued, the following will be ready, either in full or in abstract, and will be sent to such members as will notify the committee of their willingness to discuss the subjects presented.

Formulas for the Weights of Bridges, A. J. Du Bois; Vibration of Bridges, S. W. Robinson; On Specifications for Strength of Bridges, J. A. L. Waddell; On the Calculations of the Strain in Bridges for the Actual Loads, G. F. Swain; The Water Supply, Drainage and Sewerage of the Lawrenceville School, F. S. Odell; Determination of the Size of Sewers, R. E. McMath; Anchor Ice, James B. Francis; Steel, Its Properties; its use in Structures and in Heavy Guns, William Metcalf; Some Constants of Structural Steel, P. C. Ricketts; Irrigation, Edward Bates Dorsey; The Brick Industry near New York, Calvin Tomkins.

It is expected that the following subjects, most of them suggested by some of the papers published or received during the past year, will be particularly discussed, and communications upon these subjects are especially invited by the committee, viz.:

The Inspection and Maintenance of Railway Structures, the Disposal of Sewage, Recent Practice in Cable Railway Propulsion.

Members of the Society are particularly invited by the Committee to transmit their contributions at as early a date as possible, so that suitable arrangements may be made for the disposition of time at the Convention.

To insure the preparation and preliminary printing of papers or abstracts of papers to be presented at the Convention, they must be received at the Society House not later than May 31.

It is not intended to restrict in any sense the presentation of papers to the subjects above suggested.

WILLIAM G. HAMILTON,
STEVENSON TOWLE,
JOHN BOGART, } Committee.

The Electric Light in the Hoosac Tunnel.

The Fitchburg Company is to try the experiment of lighting the Hoosac Tunnel by electricity.

A Plan for the Broadway Arcade.

Melville C. Smith, General Manager of the Arcade Railway Co., appeared before the Rapid Transit Commission last week, and explained a plan for an underground road in Broadway, N. Y. He states that the first six miles of the road could be built in two years, and he showed a model how the work could be carried on under a movable bridge without interfering with traffic and travel in Broadway. He estimated the cost of the road at about \$3,000,000 a mile, and stated that contractors were now ready to make contracts for the undertaking. The road would be 24 ft. 6 in. below the surface, and the walls inclosing it could be so built that no building would be endangered. The session yesterday closed the hearings on routes. The Commission has until May 15 in which to make its report.

Locomotive Boiler Explosion.

The boiler of a New York, New Haven & Hartford switching engine exploded in the Belle Dock roundhouse early on the morning of the 3d inst. Seven men were badly hurt and the roundhouse was wrecked. The explosion is supposed to have been caused by the carelessness of the engineer in allowing the water in his boiler to get too low. The fireman, however, states that there were four gauges of water in the boiler shortly before the explosion. The boiler was six years old, and had been recently tested by a hydraulic pressure of 170 lbs. per square inch. The engine was manned by two crews and had been often worked the whole twenty-four hours.

Consolidated Engines on the Boston & Albany.

The Boston & Albany have been for some time experimenting with two consolidation engines built by the Baldwin Locomotive Works. These engines gave such satisfaction that eight more of the same kind have been ordered, making ten in all. These engines haul 35 cars on the Western Division. The standard Boston & Albany American type engine, weighing 84,000 lbs., and working at 160 lbs. pressure, hauls only 26 loaded freight cars over this division.



Published Every Friday,
At 73 Broadway, New York.

EDITORIAL ANNOUNCEMENTS.

Contributions.—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

Fifteen years ago the *Railroad Gazette* stood almost alone among American journals in opposing the narrow gauge mania, for at that time the belief in the 3-foot gauge was a kind of mania. The advocacy of the narrow-gauge had a semi-religious fervor. The arguments in its favor were of a vague and exalted character, which defied facts and figures, and appealed mostly to great general principles. The *Railroad Gazette* was denounced as an enemy of progress, and an impediment in the march of civilization. These reminiscences are called up by the words attributed to Mr. Adams in the report of his testimony before the Pacific Railroad Commission the other day. He is reported to have said: "I think a narrow-gauge road a first-class nuisance;" and yet nothing happened to the impious man. In fact the narrow-gauge lines are fast disappearing from the face of the country, and soon only the mountain lines will be left.

It appears probable that the Card Electric Brake will be among the competitors at the approaching trials at Burlington. Several brake companies have been unable to obtain cars, and, owing to this cause, the Park Electric, the Widdifield & Button and the Ward brakes will not be represented. It is also probable that the Rote and the Boyden brakes will not be on the ground. The competitors will still, however, be sufficiently numerous to make the trials highly interesting.

The Hanscom air-brake is being fitted on a train of Chicago, Burlington & Quincy cars at the Burlington shops.

The following is a list of the probable competitors:
American: Electric air-brake and buffer brake.
Card: Electric brake.
Carpenter: Electric air-brake.
Eames: Electric vacuum-brake.
Hanscom: Air-brake.
Westinghouse: Electric air-brake.

An illustration of what may be called in slang phrase "hitching on" was exhibited by the comments of the daily press on Mr. Adams' testimony, last week, before the Pacific Railroad Commission. He remarked parenthetically that he had never looked into one of the books of the company, and nearly every reporter in the room made important note of his words, and editorial comments appeared on the day following, so that Mr. Adams found it necessary to explain before he began his second day's examination. In fact, however, the same explanations, with slight exception, had been made in connection with the remark itself, and not Mr. Adams' words, but their supposed significance, was the cause of comment. The absurdity of any one man, with his duty as first officer, undertaking a personal examination of such a system of accounts would seem evident to any mind; but a paragraph writer values such a point as a place to "hitch on" certain comments which the rules of the office require. Like Orator Puff, a newspaper

may be ruined by two voices, hence the reasonableness of "rules;" but when these are the products of individual "feeling," there is such a state of things as Tom Hood describes in narrating the precautions of a company of boon companions about to make a call on one of their number who had married a laundress—water must on no account be mentioned, nor Monday, nor any article of clothing, lest offense be given. Courageous and fair minded, and worthy as he is to give expression to popular opinion, the newspaper man has nevertheless yet to declare his own independence.

On another page will be found the rules lately adopted by the stockholders of the Toledo, Ann Arbor & Northern Michigan for a division of profits with the officers and employes. It will be noticed that the scheme provides not only for profit-sharing with employes while in service, but for a bonus to be paid to those retiring after 20 years' service. To be sure, neither the share of profits nor the bonus is likely to be great, but the moral effect will probably be valuable. President Ashley hopes that the increased efficiency and sense of responsibility among the employes will result in a positive gain to the shareholders. He does not introduce the plan as one of philanthropy, but of business policy. The result will be looked for with great interest; for the combination of the fixed wages system, with some form of direct participation in profits, seems to be the most rational and promising settlement of the question of the proper relation of capital and labor. Indeed, it is quite possible that great corporations, like railroads, would find it to their interest to add to the system of division of profits provision for retiring pensions.

Could men enter the service of a company feeling that they were to make it their life work, with a direct pecuniary interest in making money for the company, and with the knowledge that faithful service would secure them from want in old age, there would be bred in them that sense of duty and that pride in the service which are the best results of military life, while constant work and promotion for merit would save them from its worst results. This spirit now exists to considerable extent among enginemen and firemen.

Profit-sharing was begun on the Paris & Orleans Railroad in 1844, and has been continued to the present time with various modifications of the system as conditions changed. In 1844, the number of employes participating in the profits was 719, and they received nearly 7 per cent. on their wages. In 1853 3,365 participants received profits amounting to 41 per cent. of their wages, and in 1882 the employes were 17,000, and the profits divided were ten per cent. of the wages. But for 20 or more years there has been little or no cash dividends, as the company is compelled to put the profit dividends up to 10 per cent. into the pension fund, so that in late years the employes have lacked the stimulus of an actual yearly cash dividend, and the result is said to be very apparent in loss of morale.

Some striking accounts of profit-sharing in private enterprises in France are to be found in a little book, "Profit-sharing," by Sedley Teylor, published by Kegan Paul, Trench & Co., London.

One great practical difficulty in the way of the adoption of the plan by railroad companies is the extremely small dividends which they can generally pay, as the greatest good of the system can only be realized when the profits shared make a substantial cash dividend. And another difficulty is the fact that the nature and habits of mind of the men cannot be suddenly changed. Whatever concessions may be made to them they will still retain for a long time much of the feeling of suspicious hostility toward the company.

The advent of Mr. C. P. Clark in the management of the New York, New Haven & Hartford is signalized by several new appointments and subdivisions of responsibilities, one more officer being added this week to the three or four announced heretofore. Mr. Clark evidently believes in keeping officers' work within reasonable range where they cannot evade responsibility or answer sharp questions with the excuse that their arms are too short to cover the required field. The adjustment of division management is one of the most unsettled things in the detail of operation of our roads and one in which there is great room for improvement; many division superintendents not only have to systematically neglect plain duties, but even after they have done this feel called upon to do in a hurried or superficial manner some of the duties which should receive far different treatment.

While Mr. Clark is taking this action we read that

the Central of New Jersey is curtailing expenses by discharging dispatchers, yard-masters, etc., which illustrates the fact that the money column, looked at in the most short-sighted way, is generally the only guide in efforts at economy. What is needed is a recognized standard, so that managers may have settled ideas as to what is profitable and what is not in the matter of staff and division officers, as well as in everything else. If a certain number of officers is necessary for a road with a good surplus, why is it not for a similar road in less favorable circumstances?

FREIGHT CLASSIFICATION AND RATES.

On another page will be found a communication from "Judex," criticising the classification adopted by the Trunk Lines, which took effect April 1, 1887.

The tenor of the argument is that small shippers should have about the same rate as large ones, so that small traders may be favored by having a cheap and uniform rate in accordance with what he conceives to be the policy of the government, ignoring the difference between wholesale and retail, as acknowledged and acted upon in all business, and seemingly under the impression that it is part of the duty of railroad management to place the shipper of small means, making purchases in proportion to them, on the same plane with a shipper of wealth who deals largely. In other words, the great corporations of the country, because of the franchises granted them, should act in a paternal manner, and remove the disadvantages of poverty.

Now, this view of the matter, though easily carried too far, is not entirely without justification. A railroad has important public responsibilities. It is desirable, both for the public and for the railroad, that different shippers should be put, as far as practicable, on an equality. Nothing can be more shortsighted than for managers to pursue a policy which shall result in crushing out business competition and building up a few firms strong enough to dictate terms to the railroad company.

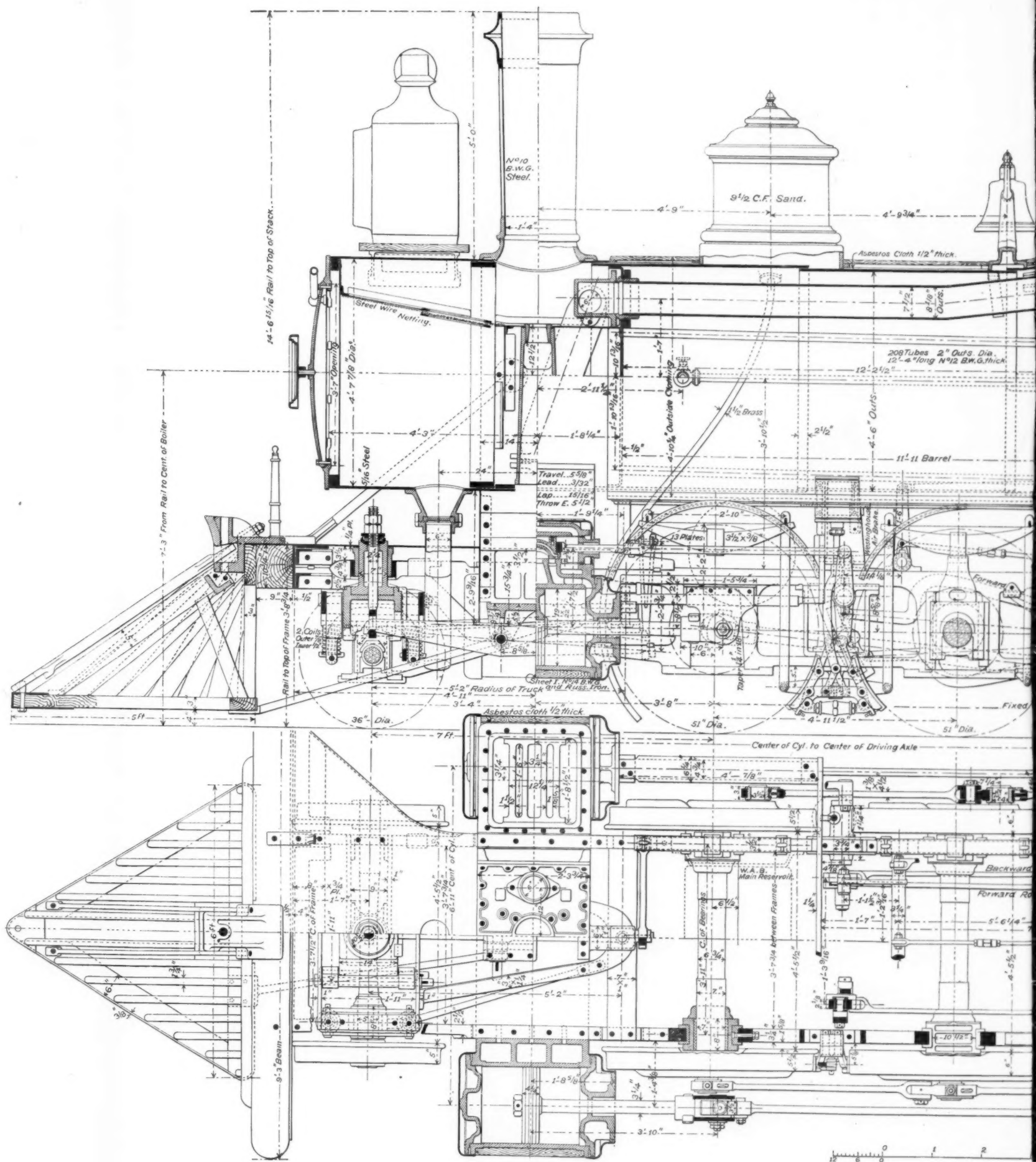
But there are great difficulties in carrying out these principles. If railroads make the rates the same when the cost of handling the goods is unequal, it results in bad economy. Any such bad economy injures the public in two ways. In the first place, it means serious loss to the railroads—not merely loss of interest to the stockholders and bondholders, but loss of wages to the employes, loss of efficient service for the public, and loss of enterprise in giving facilities for new business. In the second place, an active railroad manager will be led to avoid such bad economy by a system of special rates, and thus reintroduce, in a coarse form, the very evils we are trying to avoid. If car-load freight is much less expensive to handle than parcels, any attempt to put the two on an equality will result in some such evasion, law or no law. It is a question of public car-load rates versus secret rebates.

As to there being no car-load rates in the old tariff for such articles as sugar, coffee, molasses, etc., the reason was that such shipments were the subject of special contracts with large firms, and from the condition of affairs then prevailing, elastic in their nature, some of these shipments often comprising enough cars to make up a train. The new law requires that specific rates must be stated and that no rebates or elasticity can be allowed, hence the change.

As Judex undoubtedly knows, the new classification reduces 13 classes of east-bound freight, and several special classes, to six, the same in number and rates as the west-bound. Simple, uniform and public rates have long been demanded, are what the Inter-state law was framed to secure, and what the new classification promises.

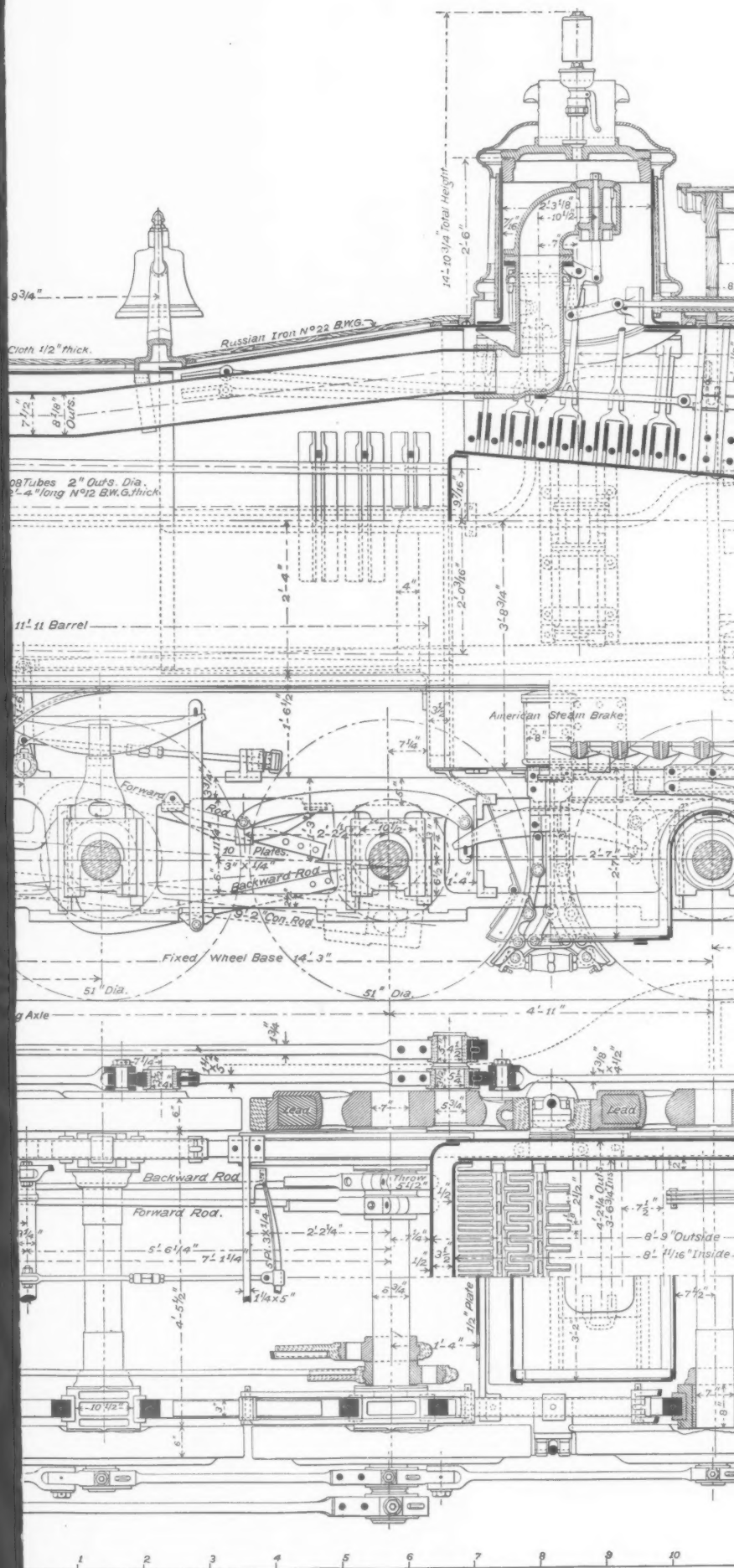
Now, to come back to the main question, is there a great difference in economy between car-loads and parcels? Most decidedly so. A car-load needs but one way-bill, with one item on it, and requires but little trouble to load, unload, or to check up, to see if goods are intact, while a car loaded with various shipments may require ten or fifteen way-bills, each with a number of items which are troublesome to load and unload, to check, to register in the forwarded and received reports of the agents, and finally to audit. In fact, the clerical labor for a car-load is about the same as that required for a single shipment that may only constitute one-twentieth of a car-load.

Not merely are these items important, they are of growing importance. While train expenses per ton are decreasing, station expenses per ton are at least relatively increasing. In large cities in particular, space, time, and natural advantages cost an immense amount of money, and put a premium on any line of policy which will throw any part of the expense of



CONSOLIDATION LOCOMOTIVE,—CANADIAN

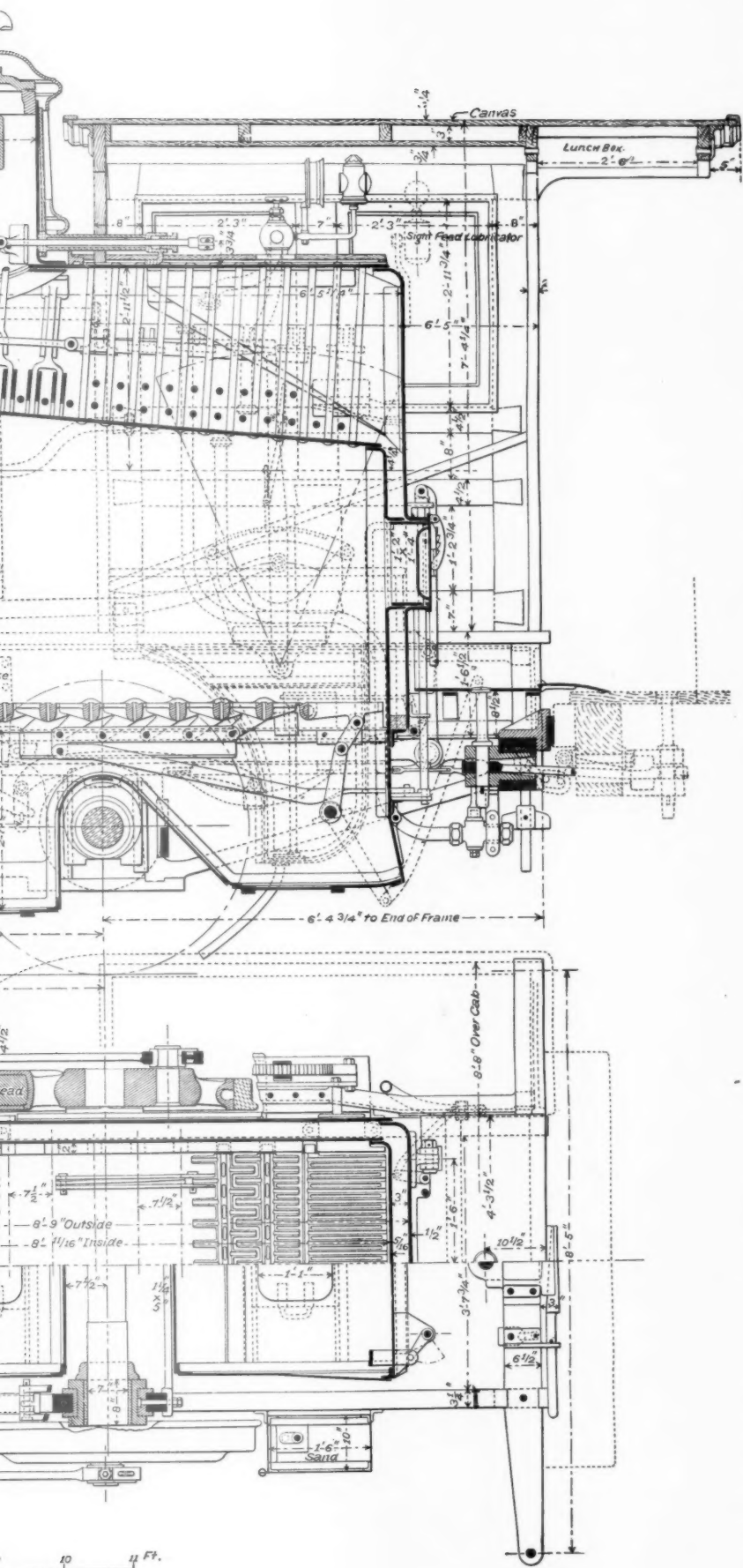
Designed by MR. FRANCIS R. F. BROWN, Mechanical Superintendent.



LOCOMOTIVE,—CANADIAN PACIFIC RAILROAD.

Chief Superintendent.

Built at the Company's Shops, Montreal.



handling on the shipper. As countries become crowded the necessity for favoring car-load rates becomes all the more apparent. The German car-load rate on high class goods is not much more than half the parcels rate; and this, be it observed, is under a system of state ownership which professes to put large and small shippers as far as possible on an equality.

The proposition that eastern manufacturers must have a rate on their freight going west, so as to sell in competition with the home product, can only be considered so long as such rates are equal to the cost of transportation, with a fair addition for profit. If the Eastern manufacturer cannot live with such a rate he must succumb to the misfortune of his location and the laws of trade.

We fail also to see why the agriculturist in the west has not as good a claim for low freights for his products coming east as the manufacturer for his going west, since the price of grain, on the seaboard, is governed by the price in Europe, and the increase in freight charges, therefore, is paid by the producer. If the rates are so great that the net amount left him will not pay the cost of production, he, too, must succumb to the inevitable, and do something else that will pay.

It does not seem reasonable for any one to complain of a 25-cent rate to Chicago, which is about 5 mills per ton per mile, as by reference to the reports of the various roads it will be found that is about the average cost of transportation, nor could the trunk lines well afford such rates going west were it not that many cars go west empty which it is better to have filled with freight at almost any price.

It is true that the difference between car-load rates and less from Chicago to Missouri River cities is less than between Chicago and New York, but the distance by the Chicago, Burlington & Quincy to St. Joseph is 468 miles; to Kansas City, 488; to Omaha, 498, and the car-load rate 30 cents; while the distance from New York to Chicago by the Pennsylvania is 912 miles; by the New York Central and Lake Shore, 975, and by the Erie, 986, while the charge per car-load is from 25 cents to 30 cents. So that considering distance, which "Judex" appears to have overlooked, the rate from Chicago to Missouri River cities is about double that from New York to Chicago. No doubt the trunk lines would be glad to make all shipments between these two cities the same if the rate should be from 50 cents to 60 cents per 100 pounds on the articles named.

Furthermore, the rate of 35 cents per 100 lbs., for less than car-loads, on sugar, molasses and coffee to Chicago is really nominal, since very little of such freight is sent to that point, except by the car-load; but we infer that if the rate was any less, and the roads acted in good faith, under the provisions of the fourth section the decrease in the tariff would be so great when points near New York were reached that the rates would be too low to pay the cost of transportation.

High-priced freights, for which the railroads are responsible if damaged, lost or destroyed, and which are seldom shipped by the car-load, are charged at one rate, which is a very small percentage of the value, and affects the cost of the material very slightly, while bulky and cheap materials, which are oftener than otherwise shipped by the car-load, and the charges on which bear a large percentage to their value per car-load and less than car-load rates. Among the former are dry goods, carpeting, butter, etc., and among the latter are paper, nails, etc. We are unable to see wherein the one lot is treated any better than the other.

The analogy between the functions assumed by the government in the carriage of mail matter and those of the roads is obviously fallacious. The Inter-state law expressly aims to introduce distance as an element of transportation charges and to do away with that form of discrimination which keeps a producer from profiting by his proximity to his market. No doubt the local merchant gets the utmost advantage from the open competition of Chicago, Cincinnati, Detroit and New York in his town, but the railroads can justly equalize advantages and disadvantages of location only within certain limits, and the hardest part of the work of the Commission will be to set those limits. Further, it should be remembered that most of the roads do not have their franchises from the National government, and have received no aid from it, in lands or otherwise; and while it can under the constitution regulate inter-state commerce, it cannot take such action as would deprive them of their property.

If our railroads were rich and their rates high, they could afford to do business by uneconomical methods for the sake of the less favored shippers. But, as a matter of fact, our shippers have about the lowest rates in the world, while most of the roads have to struggle to make ends meet, only a few, running

through populous and favored sections, being able to declare satisfactory dividends.

Under these circumstances, to compel the railroads to do business without regard to economy of handling, is virtually to deprive them of their property. Any such policy must react disastrously on the community as a whole.

THE METROPOLITAN RAILROADS OF NEW YORK.

The subject of additional railroads for accommodating the enormous and growing passenger traffic of the city of New York is now attracting considerable attention. The facilities of the present system of elevated roads are so manifestly overtaxed that something must be done and done quickly in the matter. Two courses seem open, either to enlarge the present elevated stations and strengthen the structure, so as to carry heavier trains, or to provide entirely new and additional railroads.

The overcrowding on the elevated has reached a pitch which renders it extremely fatiguing and unpleasant to travel on it at almost any hour, and as the traffic may be expected to continue to grow very rapidly, it is reasonable to suppose that the Third and Sixth avenue lines will soon become absolutely unable to carry the passengers that present themselves for transport. The cars are already packed to overflowing for many hours in the day, and travelers have a right to demand some better accommodation than is afforded by the platform of an elevated car. The number of trains cannot be increased, and they are now run so close together that collisions occur whenever the city is enveloped in fog.

The whole trouble arises from the fact that the trains are far too small. A four-car train seats only 192 passengers, and a five-car train only 240. These numbers are about half those accommodated with seats in the trains running on the metropolitan lines of other great cities. If ten-car trains could be run, over crowding would be prevented for many years. But the existing structure is not sufficiently strong to carry the heavy engines necessary to draw ten-car trains. It rests with the Manhattan Company whether it will incur the expense of strengthening their structure so as to accommodate full sized trains, or whether it will allow some other body to construct a parallel or competing line, which will, in all probability, provide for the running of express trains, and other conveniences of travel, now conspicuous by their absence on the elevated.

Bridges all over the country are daily being renewed and replaced by stronger structures, and there seems no physical impossibility in renewing or materially strengthening the present Third and Sixth avenue lines. The traffic on them could be suspended for several hours during the night and night trains run on the Ninth and Second avenue lines, reversing the present arrangement. A few months of this arrangement would enable considerable alterations to be effected. The Manhattan is now spending \$3,000,000 for additional tracks for storing cars, additional cars, enlarging stations, and so forth. This expenditure is, however, very moderate for the enormous travel on the line, and, as in other business, the proprietors should not grudge spending money in providing further accommodation for a fast increasing crowd of customers.

Should the Manhattan Company decline to meet the wants of the public, a new line, presumably up Broadway, becomes imperative. Opinion is much divided as to whether this line should be elevated or underground. There is no insuperable engineering objection to either scheme, and if properly carried out, the probable enormous volume of traffic would make either an underground or overhead line a paying investment. The choice between an elevated and an underground line is largely one of choice of evils.

The elevated line would darken the principal thoroughfare of a continent and would probably immensely depreciate the value of the principal hotels of the city, nearly all of which are placed on Broadway. On the other hand, an elevated road would be more comfortable for passengers than a line wholly in tunnel, always more or less full of smoke, steam and foul sulphurous gases, and lit solely by artificial light. A tunnel would, however, be free from interruption by fogs or storms, and would be cooler in summer and warmer in winter than an overhead road.

It is, however, manifest that a tunnel under Broadway would not annoy passers by or residents in any way. The sound of the trains would be heard only as a faint and distant rumble, and all the various annoyances as now experienced from the elevated railroads would be entirely absent.

If cable traction or electric motors were used the nuisance of sulphurous gases and the superabundance

of carbonic acid gas, so much complained of on the London underground roads, would be got rid of. The same result would be possibly more cheaply obtained by the use of Honigman's soda locomotive, which is now used on a suburban line running into Minneapolis.

It would appear that on the whole the choice between an underground and an elevated road depends largely whether the comfort of travelers or residents is to be considered paramount. An elevated road would certainly, if ordinary locomotives are to be used, be the more comfortable for the passengers; while for the property owners along Broadway a tunnel line would enhance the value of hotels and stores by the accommodation afforded, while the unsightly appearance and other objections to an elevated structure would be entirely absent.

It is well to bear in mind that any scheme for improved transit should provide the following facilities, all of which are wanting on the present elevated system, and all of which are provided by the existing metropolitan lines in London, Berlin, Liverpool and Glasgow. The fact that this list includes both elevated and underground lines shows that comfortable traveling can be secured by either system.

A sufficient number of cars on each train to seat all passengers at all times on ordinary days. The spectacle of passengers who have paid for seats, and are compelled to stand, should be visible only on holidays or extraordinary occasions, such as the Fourth of July, the arrival of a foreign monarch, or St. Patrick's Day.

Smoking accommodation on all trains.

Waiting rooms for both sexes at all stations.

Trains running with the minimum of noise and riding smoothly, and stopping and starting without the jerks that are now so annoying to the standing majority of the passengers.

Communication by roofed passages or subways, or through trains with all the trunk lines and principal ferries.

The running of express trains morning and evening to accommodate residents in the suburbs whose business is in the city has been scarcely developed at all on the New York Elevated, and in fact is a physical impossibility until three or four running tracks are provided from Rector street to the Harlem River. It is, however, done by nearly all the London elevated lines and on the Berlin and the Glasgow lines.

If these and many other facilities are provided by railroads all over the world, why should they be absent from the Manhattan? That line is in the exceptional position of having the best situation for doing a large business of any railroad in the world, and yet nothing was paid for the site on which the business all depends. Not only has nothing been paid for the privilege of using the streets, but few property owners have received compensation for the loss of air and light inflicted upon them by the erection of a noisy viaduct at their front door. The German government, who constructed the Berlin elevated, paid over \$6,000,000 to private persons for land taken, and if private citizens are thus compensated under an Empire, why should they not be as well treated in a Republic? In virtue of their extraordinary good fortune in having secured for nothing the most valuable site in the world in which to carry on the business of a railroad, the stockholders of the Manhattan should provide fully as much accommodation for their customers as an ordinary railroad that has to pay for all it gets, and compensate all it injures.

IMPROVEMENT OF THE MISSISSIPPI.

III.

THE COMMERCIAL ADVANTAGES FROM A FIFTY PER CENT. INCREASE IN DEPTH.

In former articles it was shown that the ruling low-water depths which would probably result from an improved channel would be ten feet to Cairo, eight feet to St. Louis, five feet to Keokuk, and three feet to St. Paul, these depths being about fifty per cent. more than are now found at medium and low stages. These figures are, however, considerably less than the public generally has been accustomed to anticipate as the result of a "complete improvement" of the river. But insignificant as these increased depths may appear to some, to steamboat men they will be fairly satisfactory. We wish to show that these depths will be sufficient to transport all the products of the valley which are ever likely to seek such an outlet, and that the outlay would probably be justified. The arguments cannot here be given in great detail, but the facts stated can be verified.

The transportation of grain in bulk will first be considered. This is done by employing barges. A single tow-boat will take from four to eight barges, carrying some 8,000 tons of freight. The cost of this plant complete is about \$125,000. The barges when loaded never

draw more than nine and a half feet. The tow-boat draws some five or six feet. A round trip is made from St. Louis to New Orleans and return in about twenty days. The consumption of fuel for a round trip is about 1,100 tons of coal, which is worth on board about two dollars per ton. A crew consists of about 33 men, at a total cost of about \$90 a day. The life of a barge is about 8 years, and of a tow-boat about 10 years. The largest barges are 225 feet long, 35 foot beam, and 8 feet depth of hold in the clear. The barges now in use will carry, on the average, about 50,000 bushels of grain, or 1,500 tons. The rate charged for transporting grain from St. Louis to New Orleans, a distance of 1,200 miles by river, and 700 miles by rail, is six cents a bushel in fair stages of water, and nine cents a bushel in low stages. For the depths cited as the result of an improved channel, the smaller rate of six cents a bushel would be the maximum rate charged. The average rate by river during the past ten years was seven cents. The average rate by rail to New York, from St. Louis, for this period, a distance of 1,065 miles, was 21 cents a bushel. The new rate, under the Inter-state Commerce regulations, to New York is 19 cents a bushel.

The low-water depths proposed in these articles would prove very satisfactory to the barge line people, and would bring practically the minimum rates of transportation, as there is no object in loading to greater depths. It would not be economy for ocean steamers to engage in river traffic or to ascend the river above New Orleans for their loads. They are too expensive a craft to engage in this inland trade. It would require three ocean steamers to carry the grain transported by one tow-boat and barges, and the cost of these ocean steamers would be six or eight times the total cost of the towing plant.

So far as the transportation of grain and other freight in bulk is concerned, the depths herein cited, viz., ten feet to Cairo and eight feet to St. Louis, would prove all that is needful to confer the maximum benefits, or to give the minimum freight rates between St. Louis and New Orleans. If these depths are sufficient for the barges, much more are they sufficient for the steamers engaged in the transportation of passengers and general merchandise. These usually draw from four to eight feet on the lower river, and seldom have occasion to draw more. They are in fact rarely loaded deeper than six feet. From St. Louis to Keokuk an assured low-water depth of five feet would enable grain to be transported in bulk at rates much below what railroads could afford to carry it for, and the steamboat traffic would be put on a reliable and paying basis. The great uncertainty in the schedule times of boats on the upper river, owing to detentions on sand-bars, is alone sufficient to cause shippers to abandon this annoying method of transportation and resort to the more expensive but more certain railroads. With a depth of five feet, however, the boats could be nearly as prompt as a freight train, and this promptness, together with the lower rates which would result, would deflect a very large business from the railroads to the river.

Above Keokuka low-water depth of three feet would allow rafts and lightly loaded steamers to pass at all seasons with certainty and dispatch. Although the traffic on the upper river could not equal that on the river below St. Louis, the cost of the improvement would be proportionally less, and so the relative advantages of the improvement of this portion of the river would doubtless be equal to those of the lower river.

Let us now try to ascertain approximately the advantages which would come from the fifty per cent. increase in the low-water depth, from St. Paul to New Orleans. We may say at once that the maximum low-water cargoes would be doubled. This would hold for about five months of the year on the lower river, and for about four months of the year for the upper river, or, in other words, for about half the season of navigation.*

On account of the central location of St. Louis on the Mississippi River, being the dividing point between the upper and the lower river, the commercial statistics of that city will be chosen on which to base an argument as to the effect of an improved river on the country at large. The following statistics are taken from the last (1886) report of the Secretary of the Merchants' Exchange of St. Louis.

For the last sixteen years (1871-1886) the average annual receipts by river at St. Louis have been 961,000 tons, and the average annual shipments have been 736,000 tons, making a total of 1,697,000 tons of river traffic annually. To form a distinct conception of the amount of this business let us assume it to be carried by rail. If an average car load of freight is ten tons,

* The river south of St. Louis has been closed to navigation by ice for the past twenty years an average annual period of thirty-six days. The period of suspended navigation is somewhat more than this.

this would require 169,700 cars. If we put twenty loaded cars to a train we have 8,485 trains, or 4,225 trains each way. Counting 240 full business days in a year, we have eighteen round trip loaded trains a day.

The average length of shipment of this material was about 850 miles by river, or say 500 miles by rail to reach the same points. The St. Louis traffic by river, therefore, would equal say 846 million ton-miles annually, if the corresponding distances by rail be used.

The average rate of freight on grain, etc., by rail from St. Louis to New York for the past ten years has been 35 cents per hundred, or \$7 per ton, for 1,065 miles. This is equal to two-thirds of a cent per ton-mile. The average rate on this class of goods from St. Louis to New Orleans, a distance of 1,200 miles by river and 700 miles by rail, has been 17.8 cents per hundred by steamboat in parcels and 11.3 cents per hundred by barge in bulk. This would be equal to 6.9 cents a bushel. Taking for the river traffic the equivalent length by rail, or 700 miles to New Orleans, we find the cost of a ton-mile by river, for the corresponding rail distances to be for steamboats

$$\frac{17.8 \times 20}{700} = 0.51 \text{ cent per ton-mile, and by barge it is } \frac{11.3 \times 20}{700} = 0.32 \text{ cent per ton-mile.}$$

There is no doubt but that the all-rail rate on grain from St. Louis to New York has been less on account of the river competition in the export trade.

The St. Louis river traffic is divided about as follows: Steamers, 57 per cent.; barges, 23 per cent.; rafts, 15 per cent. It is estimated by steamboat men that the increased depths herein stated as the probable result of a complete improvement of the channel, allowing cargoes to be doubled in medium and low stages, would result in a reduction of the average annual rates of at least twenty per cent. This would then result in a saving of 0.10 cent per ton-mile on steamer traffic, and 0.06 cent per ton-mile for barge traffic. Taking the St. Louis receipts and shipments alone, this would give an annual saving on steamer traffic of \$484,000. The annual saving in barge shipments would be \$143,000. No saving will be computed for the raft business. The total annual saving on the St. Louis river traffic alone would be \$627,000.

The ratio of the St. Louis river transportation to the total river carriage from St. Paul to New Orleans cannot be exactly stated, but it is not far from one-fourth. On this assumption, one might say that the total annual saving from an improved channel on the Mississippi River would be some \$2,500,000. But this makes no allowance for any increased traffic, the above estimates being made on the average St. Louis traffic for the past sixteen years. It is also evident that the benefits of a cheap, water transportation route are by no means measured by the reduced rates on the traffic actually carried by that route. As long as the all-rail routes undertake to compete for the business, the advantage to shippers is measured by the reduction in rates with the whole amount of business on all competing lines. It is of no consequence whether or not the business is actually done by the water routes, so long as they are efficient in holding down the rates. The true measure of an essentially cheap route is, therefore, the difference between the rates, with and without it, into the entire business which might be carried by that route.

The arguments already made before the Commission for the suspension of the long and short haul clause of the Inter-state law, show that the influence of the water routes has been by no means limited to the traffic carried by them. It is apparent, too, that if the railroads are compelled to keep through rates which are in themselves profitable, they cannot compete with the water routes for bulk freights. If, then, the provisions of the Inter-state Commerce act survive and are enforced, we may expect such a traffic on the great internal waterways as has never been seen there yet.

In conclusion, we may assume that the "complete" improvement of the Mississippi would result in a saving of \$2,500,000 on the traffic now carried on the river, and an equal reduction on traffic carried by rail, or a total saving of \$5,000,000 may be taken as a safe estimate of the result of securing and maintaining a 50 per cent. increase of navigable depth. On a purely business basis, then, it is evident that the government would be warranted in spending \$100,000,000 as a first investment, and \$2,000,000 annually for maintenance. Whether or not these sums would accomplish the moderate results herein considered feasible, is of course uncertain; but it probably is not advisable to anticipate anything very much better than this. If this business of Mississippi River improvement is to be prosecuted, it should be with a clear understanding of the size of the undertaking, and with a full determination to prosecute it to completion, even to the expenditure of such large

sums as here indicated. The cost of maintenance will be very great, say from two to five per cent. of the first cost, and hence this item is probably of as much consequence as the original expenditure.

Operating Expenses.

It is not often that a business can be carried on successfully without constant and painful watch of the items of outgo; certainly the business of running a railroad cannot. To the managers, minute analyses of its expense account, such as that given on another page of this issue, if accurately made, must be of great value. They furnish an invaluable basis for comparison of one period with another, and a means of getting the relative effects of economies. For instance, economy in track repairs may soon show itself on the wrong side in car and engine repairs, or a saving in fence repairs may be made at the expense of stock killed. Such tables as the one given on another page if determined from year to year, and if, as we have said, they are accurate, admit of weighing the items one against another, and the eventual establishing of really economical practice. They furnish also a ready means of ascertaining the maximum good possible from any proposed economy. At first sight it might seem well worth while to spend \$2,000 to save 10 per cent. of the cost of lubrication of car journals on a road of which the operating expenses are \$3,000,000; but when it is seen that 10 per cent. of 0.65 per cent. of \$3,000,000 is but \$1,950, the wisdom of the experiment is less obvious. The table suggests some general consideration of the chances of economy in the various items given.

The prospect of economy in train service is not encouraging. Small savings in oiling or heating or even in wages may be made, but the introduction of power brakes in freight service cannot materially if at all lessen the number of train hands, except on through trains. The use of cars capable of carrying heavier loads, however, promises to still further reduce the cost of freight train service.

In engine service we may expect greater savings. The fuel item is the largest one in the engine account, amounting in the case given to 9.72 per cent. of the operating expenses. It is not too much to hope that improvements in locomotives and in firing may reduce this one-third, or even one-half, which would at once reduce the operating expenses by from 3 to 5 per cent., a saving of from \$100,000 to \$150,000 on a road of which the operating expenses are \$3,000,000. That such a saving is not at all improbable is seen from recent English experience with compound locomotives. Other savings may be looked for in lubrication, but probably not in the other items of engine service.

Foreign agencies are an expense which often seems large for the results achieved, and some saving should be possible here. One of the savings hoped for by some managers will be made from the abolition of expenses away from the line of the road, which are generally grouped under this heading.

Certain taxes, which are not classed under operating expenses, but which have cut seriously into the net revenues of the railroads, are passes, commissions on ticket sales, and special freight rates. These, there is much reason to hope, will be very much reduced in the future. A pretty resolute struggle is now going on to accomplish that end, and with good prospect of success; but aside from these gains, and the economy to be made in engine service (as suggested above) the chances of speedy, large savings seem remote. They must come by the slow and minute perfecting of methods and appliances. Water may be purified, track may be kept more uniformly good, safety appliances may diminish loss of life and property, interlocking apparatus may save stops and thus economize fuel; insurance and repairs may be diminished by better structure, and so on through the list. But all these savings involve increase in first outlay, and the greatest skill and care in administration, and so we get back to the text with which we began—the importance of accurate and minutely analyzed accounts.

Imprisonment of Enginemen.

The killing of John Murphy, a man employed in the erection of a new station on the Manhattan elevated road in New York, who, on April 26, was run over by the engine of a train while attempting to cross the track ahead of it, is made the occasion of a course of action by the courts, which may be termed virtually unprecedented. Albert B. Keyes, the engineman, against whom there is no unusual presumption of guilt or negligence, was arrested and imprisoned to await the action of the coroner's jury, and only released (after two days) on \$10,000 bail, a very large figure,

Murphy was employed by the contractor who was erecting the building, and so, although not a regular employé of the railroad company, was to all intents and purposes one and not a trespasser; though if he had been the most lawless intruder there is no reason to suppose that the action of the authorities would have been different. But to warrant the arrest of the engineman or the placing of bail after arrest at such a high figure it must be assumed either that he willingly ran over the man, or that he was carelessly keeping no lookout ahead and so caused the death by pure negligence. The first of these assumptions is too violent for notice. Locomotive runners are compelled to see employes, trespassers, passengers and others take hazardous chances before their eyes in scores or hundreds of cases every week, and so, perforce, get into that habit of mind where they will not sound the warning signal so early as would a nervous woman, for instance; but that an experienced runner on a road where the conditions require such a high standard of mental activity and vigilance, would not, after seeing a person ahead of him, take all the precautions that prudence would dictate is, at least, extremely unlikely. The ordinary instincts of humanity govern unconsciously in such circumstances, and nobody has ever claimed that locomotive runners are deficient in sensibility. On the contrary, they are regarded as far above the average in many respects.

That this runner may at the critical moment have had his eye directed elsewhere than toward the reckless man is indeed possible; but even if allowed, this does not by any means warrant a criminal charge. Experience shows that nothing less than a lion or a lively rattlesnake can hold the average man's attention to one point for a protracted period, and, in point of fact, the engineman who will run even the 10-mile stretch of the elevated road and keep his eye constantly ahead would be very hard to find. A constant lookout should be maintained, and no lower standard should be set for runners to aim at; but, with human nature as it is, to impute criminality to a momentary slip—which may, indeed, be enough to precipitate disaster—violates all the instincts of our laws. In the outcome it is no better than the high-handed action of local authorities in Mexico, who imprison enginemen for long periods on account of the most trifling casualties, without deeming a hearing necessary.

Public opinion in this country has generally been strongly the other way, if we may judge by the records of the courts. Many arrests have been made, and it is probably safe to say that very few of them were not warranted by strong presumptive evidence of gross negligence; but in a very large share of the cases the District Attorney or other prosecuting officer has neglected to bring the accused person to a final trial. The obvious conclusion, and, perhaps, generally the only warrantable one, is, that these officers believe that the sentiment of the community does not demand the serious punishment that the laws allow, and that justice is not made to suffer by the position they take. At all events there has been no very serious criticism of their course in this respect. If locomotive runners are to be jailed every time they run over a person there would have to be an enlargement of the prisons all over the country, for so long as careless people exist in the world these casualties will happen, and there would also be a large crop of resignations among the fraternity of the foot-board.

Possibly the attitude of the New York city courts and community towards the railroads is exceptional and should not be taken as indicating anything like a widespread feeling. Certainly such an attitude, if it were to obtain generally throughout the country, would be evidence of a complete reversal of public sentiment as hitherto understood, and would be applying to a large and respected class of the community, the "rule of" guilty till proved innocent, "instead of their birthright of innocent till proved guilty."

The Staff System.

The article in another column on the staff system as used on English roads is by Mr. E. B. Ivatts, of the Midland Great Western Railway, of Ireland, a gentleman of wide experience and information, his railway education having included service in America and India as well as Great Britain. He is also the author of a comprehensive book on station management, which has heretofore been brought to the notice of the readers of the *Railroad Gazette*.

The information generally accessible in this country concerning railroads in England seems to create a general impression that everything there is double track; that single track lines are virtually unknown; and Americans thus naturally come to the conclusion that they have nothing to learn concerning single track working. But, as might naturally be supposed on a little reflection, and as shown by Mr. Ivatts' figures, we see that the real practice there is, as it would be any where, to work single until the business warrants the building of a second track. We see that there are

in all parts of the United Kingdom a considerable number of single track lines, where the business is undoubtedly small, the number of trains and the amount of supervision necessitated (or given) very limited, and the telegraphic facilities meagre; so that the conditions, so far as our present purpose is concerned, may be regarded as very similar to those on hundreds of branch lines in this country.

In view, therefore, of the well-known conservatism of the English, and of the fact that conservatism is universally regarded as conducive to safety, we place Mr. Ivatts' article before American readers. The staff system certainly has merits, and, if they are at all adapted to American circumstances, it is our business to look into them.

The main features of the staff system are simplicity and safety. These terms are so familiarly used that we do not always keep in mind their actual weight. In this country we generally assume that running by time-table is the acme of safety, and that although we may often be called upon to move in the other direction—i. e., make added use of the telegraph or other devices that are supposed to increase the risks, we are safe enough on the conservative side. But in the working of the innumerable short branch and other lines of very light traffic there are many little things which constantly tend to undermine the manager's confidence in the safety of the train service. There are many important operations performed by train and station men which are day after day and possibly year after year done in the most perfunctory manner, and wholly from habit or custom, without a single glance at the rules. Very frequently commissioners' investigations bring this fact to light. Enginemen who have run successfully for years prove unable to find in the rules any warrant for important actions which they are daily performing. What superintendent has not hesitated to send a snow-plow or other special train over a branch lest the single crew at the further end should be found to have ventured out without authority, on the assumption that past custom (not law) had given them the exclusive right to the track on the branch? A book of rules in the pocket is easily neglected and allowed to drop out of mind, and if there be any chance to deviate from the strict letter of the law under circumstances where this deviation will not tend to correct itself, there is always a liability that there will be men who will do it. A tangible and visible object like the train staff, therefore, is a constant reminder of duty, and is superior to written rules in the same way that any object lesson is superior to the oral or written kind. It is as much simpler than a rule as a single word is simpler than a score of words or a dozen sentences.

The simple way in which the safety of gravel trains working on main line can be provided for ought to make the system well worthy of investigation here. There is, of course, plenty of chance for thick-witted men to cause delays, but this evil is not by any means incurable, and moreover, the staff system can be subordinated to a regular dispatching system to any extent desired. The provision in station-masters' rule No. 8, for the return trips of pushing engines, is also a valuable feature. There are very likely places where it could not be applied to advantage, but it is worthy of consideration nevertheless. At places on single track roads where pushers are habitually used, there is often much anxiety (on somebody's part) at the foot of the grade lest a second train shall follow before the track is clear.

Tight v. Slack Car Couplers.

The main results of the tests made on the Chicago, Burlington & Quincy with trains of slack and tight couplers were given in our last issue. Further trials have confirmed the results already obtained, and show that though the use of tight couplings does not altogether abolish shocks, the bumps are far less severe than with slack couplings. The slidometer was moved as follows with different styles of couplers:

Coupler.	Average slack.	Movement of slidometer.
Ames.....	1.7 in.	5 in. to 10 in.
Janney.....	.5 in.	3 1/4 in. to 5 1/4 in.
Perry.....	2.1 in.	8 in. to 14 in.
Potter.....	3.1 in.	11 in. to 18 in.
".....	.3 in.	5 in. to 11 in.

The shocks were obtained in making emergency stops with trains of twenty-seven cars, including dynamometer and way car. In each case the five cars next the engine were fitted with the Westinghouse brake and Janney coupler. The remaining twenty freight cars were fitted with the coupler under trial. A consolidation was used and the stops were at speeds varying from 22 to 44 miles an hour. Half the stops were made on a level and half on a down grade of 53 ft. per mile. In these tests all the cars were empty.

In the following tests half the cars were empty and half loaded, but the other conditions were similar:

Coupler.	Slack.	Movement of slidometer.
Perry.....	2.1 in.	5 in. to 8 in.
Janney.....	.5 in.	1 1/4 in. to 7 1/4 in.

The results are on the whole in favor of the close coupler, but show that with emergency stops shocks are not yet wholly abolished.

On Friday a series of tests were made to further demonstrate whether as many cars could be started on a heavy grade with close couplers as with links. A train of 51 empty cars was made up, and out of this, with 15 ft. of link slack, the engine succeeded in starting 46 cars.

The slack was then blocked out by placing iron wedges between the drawbars, and the same number of cars were started, apparently with less trouble, fully substantiating the results of former tests. Link slack apparently is of no advantage whatever over the spring compression in starting trains.

It may be remarked that the violence of the shocks cannot

be altogether gauged by the relative movement of the slidometer. The blow with loose couplers was sharp and distinct, while that with close couplers was cushioned.

President Adams Before the Pacific Railroad Commission.

The theory of trial by jury, that twelve average men shall represent the community, has a certain application to all investigations in which the people are represented by a commission. The evidence elicited must not merely satisfy the commission but be comprehensible also to the intelligent public, and it is therefore a hopeful sign of some final determination of a long unsettled question when the daily press gives so much space to it as it has done during the past week to the Union Pacific affairs. In this respect, also, President Adams' examination may be regarded as peculiarly fortunate. Throughout, his manner was frank and his replies without apparent reservation, and it is to be regretted that the examination could not have appeared at once in a verbatim report of questions and answers.

For in a certain important sense the President of the Union Pacific was called to explain in detail the growth, history and traffic management of the railroad, and show the difference between the popular conception of a line connecting two points and a great freight road collecting its traffic wherever that traffic originates. Possibly half of the time of the two days' examination was spent in bringing out the contrast between these two conceptions of the railroad. Such subjects as the necessity for branch lines, the reasons determining their location, the methods of acquiring or constructing them, the necessity for their control and operation by the main line, were constantly in course of explanation, while the relation of the haul on the branch to that on the stem had again and again to be explained as a fundamental principle, necessary to a proper comprehension of statements of account. Mr. Adams was required to give as much of the history as he knew of 25 or more branches, to describe the location and traffic of each and to give his opinion of its present value and of the purposes and policy of the gentlemen under whose control it was acquired.

The question of the road's charter limitation was referred to by Mr. Adams at the opening of the examination, but was not reached by the committee until nearly its close. Mr. Adams briefly indicated his method of submitting questions involving assumption of obligations to counsel and abiding by their decision. Their opinions were then called for and will appear in evidence.

His examination will be continued after the members of the commission have had opportunity to make some examination of the accounts of the company.

The record, character and manner of a man undergoing such an ordeal affect all minds for or against his cause, and Mr. Adams has in these regards peculiar advantages, and his good humor and frank common sense in no way lessen them. The Commission treated him as a man whose testimony could be obtained, and asked questions which in another case would have been more wisely withheld. They appreciated their witness, and called him to pass judgment on the acts of his predecessors and associates. In doing so, he seemed neither to forget himself, nor to measure others with any ungenerous standards, and some of his expressions of favorable opinions, notably that concerning the chief engineer of the road, were most emphatic. If the safety of society depends upon honest service, and not upon suspicion of its commercial agents, this portion of Mr. Adams' testimony may be called very encouraging.

The plan of the new Erie depot brings to mind an old and customary defect in the design of stations at great city terminals. That is the want of provision by which the commuters and suburban passengers may go at once to trains without passing through the waiting room. Under the time-honored arrangement now in vogue, impatient and hurrying crowds must for two or three hours every evening jostle through inadequate door-ways, circumnavigate the waiting room benches and push each other out of other door-ways for the ostensible purpose of showing their tickets to door-men. This annoying and exasperating experience is repeated day after day and year after year, and the aggregate of unhappiness produced is great enough to call for serious effort to reduce it. The inconvenience, of course, is greatest in those stations where passengers arrive by ferry, and are concentrated in boat loads. The reason for the practice is the supposed necessity for examining tickets before passengers are admitted to the trains, but as a matter of fact it is impracticable for the door men to see each ticket, at least in the Jersey City stations, and commuters' tickets are never examined there. The passengers who arrive on the Jersey City side unprovided with tickets are comparatively very few, even the through passengers, while the great mass of the travel is of people who are thoroughly familiar with the routine of the station and trains; and of those arriving without tickets, or who have occasion to wait, there can be but very few indeed who do not know enough to find the proper place to stop, or who would willfully or ignorantly pass directly to the train-house. There is a certain very small percentage who need to be headed off, and turned back to buy tickets or to wait for trains, and of these some greater or less number are caught by the doorman, but that a thousand should have to suffer for the ignorance of one seems to indicate a lack of ingenuity among those who design stations.

It is said that the Pennsylvania has now resumed passes to newspaper men, having metamorphosed them into "contracts," and some of the Western roads have resumed the

issuing of passes to stock-men in charge of cattle. It becomes more and more apparent that the summary cutting off of passes on the first of April was, as it seemed to be at the time, in many cases merely a device for "squaring up the books" and beginning on a fresh page, as has been done so many times before. The field becomes so infested with noxious weeds that it once in a while needs to be "plowed under" and a new set of plants started. It is to be hoped that the old imposition (or farce, as it often proved to be) of requiring the recipients of these tickets to surrender all their rights will not be re-enacted. When a ride is manifestly included in the price paid as in the case of shipments of carloads of cattle or when it is clearly given for a definite consideration, as the managers now say is the fact in the case of publishers' passes, the exacting of the agreement to not hold the carrier liable, etc., savors very strongly of the quality vulgarly termed "cheek." If passes are to be given after all, the conditions should be simple, open and legal.

A St. Louis paper says that the Wabash Western road has already issued its order for the examination of trainmen's watches, to be put in force June 1. The account says examinations must be repeated every three months, that all watches "must be equal to a 15 jeweled patent regulator, adjusted to heat and cold," and protected by the anti-magnetic shield, and that men when leaving their watches for repairs with other than the company's regular jeweler must have the temporary watch examined and pay 25 cents fee for it.

The Connecticut law prohibiting the running of trains on Sundays between 10:30 a. m. and 3 p. m., which goes into effect June 1, will apparently affect passenger traffic very little, the New York, New Haven & Hartford, the chief passenger road of the state, having only one through train, the Shore Line Boston express, which will have to be taken off. The summer picnic excursions, which are run on camp meeting time-tables, will probably pursue their pious course as heretofore, as such services always begin early and end late.

In a case cited in our "Notes of Decisions," in another column, the Court decided that a railroad could not be taxed by a county to pay the subscription of the county to aid the construction of the road. One would suppose not. The clever fellow who thought of it ought to try his hand at mechanics. He might design another Fontaine locomotive.

In its issue for April 30 *Engineering News* notes that but 11 of the 21 bridge failures in 1886 were reported in the *Railroad Gazette* record of train accidents, and makes an extended and severe criticism of the omission, which would have been justified if it had any basis of fact. Twenty of the twenty-one failures were reported as train accidents in the *Railroad Gazette* record, and the other one, which did not involve a train accident, was described in another column. A valued correspondent, who is perhaps, the highest authority on this subject, writes: "Knowing by experience the difficulty of getting full particulars of accidents, I am surprised, not that your record contains some errors, but that it is in the main so full and complete."

In commenting on Mr. Mattes' paper on Rail Sections, which we published April 8, we quote Mr. Mattes as saying, concerning the radius of the upper corner, "the Delaware, Lackawanna & Western rails show plainly that $\frac{1}{4}$ in. is not enough," etc. What he actually said was, "the Delaware, Lackawanna & Western rails show plainly that $\frac{1}{4}$ in. is not, and the later Pennsylvania and Lehigh Valley rails indicate that $\frac{1}{4}$ in. is too large."

Weekly payment of wages, which is required by law in Massachusetts, and which has now been in force on the Boston & Albany for a year, is spoken of by Paymaster Holt of that road in anything but complimentary terms. He says the system has many disadvantages and nothing in its favor, and from expressions of employés he believes that they agree with him. Each man's surplus for savings is now only about one-fourth what it was at each pay day under the old plan, and consequently is more likely to be spent than saved. The cost to the road of this system is four times as much as that of the monthly plan; 15 more men have to be employed, and the pay-car run four times as often. A pay-car every week must partake considerably of the nature of a regular train, and be quite an item of expense. The more sensible plan of paying by check, which has been adopted by several Western roads with much satisfaction, would seem to be particularly applicable to Massachusetts roads.

The following comparisons of the earnings of 70 roads are made by *Bradstreet's*:

Earnings per mile from Jan. 1 to March 31.				
Groups.	Roads.	1887.	1886.	1885.
Grand totals.....	13	\$982	\$985	\$1,007
Central Western.....	19	1,409	1,255	1,227
Eastern.....	7	2,210	2,013	1,824
Trunk lines.....	4	1,434	1,395	1,187
Southern.....	17	1,264	1,094	1,150
Southwestern.....	7	1,352	1,097	1,301
Far Western.....	4	882	802	795
Totals.....	70	\$1,223	\$1,110	\$1,137
Percentage of Increase in Earnings per mile for 1887 over				
January.....		1886.	1885.	1884.
February.....		16.7	2.4	5.3
March.....		3.2	9.	4.5
March.....		11.3	8.6	7.

Attention is called to certain special influences which should be taken into account in any study of the figures. The Southwestern strikes in March, 1886, decreased abnormally the earnings of that group of roads; and the severe weather of January, 1886, decreased all earnings in that month. The

elevated roads of New York are included in the Eastern group and swell the earnings per mile disproportionately.

The lake route from Chicago is now open, the first boats from there having arrived at Buffalo April 29, though not without experiencing considerable trouble with ice. The prevailing rates are $3\frac{1}{2}$ cents a bushel for wheat and $3\frac{1}{4}$ for corn. The boatmen had asked 4 and 5; they hope to get better rates when the ore ports are open. Duluth harbor is now open and several vessels have been chartered for wheat to Buffalo at 6 cents a bushel, but Lake Superior is not expected to be open for several days yet. The Erie Canal is to be opened May 7. The boats thus far chartered at Buffalo for New York have taken wheat at $6\frac{1}{4}$ @ $6\frac{1}{2}$ cents a bushel, and corn at $5\frac{1}{4}$ @ $6\frac{1}{2}$ cents.

Record of New Railroad Construction.

Information of the laying of track on new railroad lines in 1887 is given in the current number of the *Railroad Gazette* as follows:

California & Oregon, north of Klamath River, Cal., 7 miles.

Maricopa & Phoenix, in Arizona, since last reported, 4 miles.

This is a total of 11 miles for the week, making 967 miles reported thus far for the current year. The new track reported to the corresponding date for 16 years has been:

Miles.	Miles.	Miles.	Miles.
1887... ..967	1883... ..1,216	1879... ..493	1875..... 229
1886... ..652	1882... ..2,503	1878... ..412	1874..... 423
1885... ..340	1881... ..1,018	1877... ..354	1873..... 738
1884... ..755	1880... ..1,264	1876... ..535	1872... ..1,136

This statement covers main track only, second or other additional tracks and sidings not being counted.

TECHNICAL.

Locomotive Building.

The Pennsylvania has just placed an order with its Altoona shops for 88 large freight locomotives.

The Car Shops.

The Alabama Car Works at Anniston, Ala., will build 12 flat cars for the East Alabama.

The Southern Pacific is to have 600 box cars built by the Ensing Manufacturing Co., of Virginia. They will cost \$276,000. In addition 100 flat cars and 100 coal cars are being built at the company's shops in Sacramento, Cal.

The Anniston Car Works, Anniston, Ala., have increased their capital stock from \$200,000 to \$400,000.

Manufacturing and Business.

The Anniston Pipe Foundry, Anniston, Ala., has begun to build its new works. The main building will be 492 ft. by 90 ft., with a capacity of 200 tons per day, making pipe from 3 to 60 in.

Messrs. R. P. McCormick & Co., contractors for the double-track railroad tunnel at Kansas City, Mo., 1,000 ft. long, have ordered of the Ingersoll Rock Drill Co., of New York, a complete plant of tunneling machinery, consisting of a "Straight Line" air compressor, air receiver, 7 Ingersoll tunneling drills, with columns, mountings, etc., boilers, etc., etc. The contract requires the completion of the tunnel within 90 days.

The Abendroth & Root Manufacturing Co., of New York, have just received a large order from the Southern Cotton Oil Co., for their water tube boilers, about 4,000 horse-power in the aggregate. These boilers will be erected for the oil factories at Houston, Texas; New Orleans, La.; Little Rock, Ark.; Atlanta, Ga.; Savannah, Ga.; Wilmington, N. C.; and Montgomery, Ala. It is stated that this is the largest order for steam generators ever given at one time.

The Wainwright Manufacturing Co. of Boston report sales of their corrugated tube feed water heaters for the month of April as follows: 2 in Boston, 2 in Bridgeport, Conn.; 4 in New York, and 1 each in Natick, New Bedford, Mass.; New Rochelle, N. Y.; Waterbury, and Plainville, Conn., aggregating over 1,400 horse-power.

Iron and Steel.

The Alexander Iron Co., of Tennessee, have elected the following officers: J. H. Zarecor, of the Tennessee Range & Manufacturing Co., President; Malone Wheelless, Vice-President; Jno. A. McEwen, Secretary; the Mechanics Bank, Treasurer; Jno. F. Alexander, General Manager. The immediate erection of a plant for the manufacture of malleable iron, capable of converting from 30 to 40 tons daily, was decided upon. The company will negotiate with iron-works and furnaces ready to use its method.

Moorhead, Brother & Co., of the Vesuvius Iron Works, at Sharpsburg, Pa., have given out the contract for a new building, which they expect to have completed about July 10. The new building will be entirely of iron, and will be 390 ft. long by 125 ft. wide.

Jas. P. Witherow, Pittsburgh, Pa., has received the contract to build the two furnaces for the DeBardeleben Coal & Iron Co., at Bessemer, Ala. The capacity of each will be 100 tons daily.

At a special meeting of the American Tube & Iron Co., of Middletown, Pa., the capital stock was increased from \$500,000 to \$1,000,000.

The Calumet Iron & Steel Co. has started up its splice-bar mill, a new acquisition to the plant at Cummings, Ill. The new mill is running full time, and is rolling out splice-bars at the rate of about 50 tons a day.

The Rail Market.

Steel Rails.—Only a few small sales reported. A few of the mills have room for orders for early delivery, which can be placed at \$28 @ \$28.50.

Old Rails.—Teas have been offered at \$21.50 and double heads at \$22.

Scrap.—Foreign scrap has been offered as low as \$20, with no business done. Yard scrap is offered at \$23 @ \$23.50.

Rail Fastenings.—Spikes, 2.45 @ 2.50c. here; angle fish bars, 2.20 @ 2.25c.; steel angle bars, 2.25c.; bolts and nuts, 3.15 @ 3.20c., and bolts and hexagon nuts, 3.30 @ 3.40c.

A Co-Partnership of Civil Engineers.

George S. Morrison and E. L. Cortbell have formed a co-partnership under the name of Morrison & Cortbell as consulting and constructing engineers of bridges, railroads and river and harbor works, with offices in New York and Chicago. Mr. Cortbell is Chief Engineer of the Atlantic & Pacific Ship Railway.

Another Car Heating Company.

Articles of association were filed in New Jersey this week for the Safety Car Heating and Lighting Co., with a capital stock of \$1,000,000. Among the incorporators are Sidney

Dillon, Henry G. Marquand, Wallace C. Andrews, Wm. P. Shinn, Richard A. Elmer, Silas B. Dutcher, Spencer Trask, J. G. McCullough, Arthur W. Soper, Thos. Rutter, J. J. Slocum and Edward Lauterbach. The system to be used includes the present circulating devices in coaches, with the use of either water or air, which will allow the railroad company to heat their cars when detached from the trains, the same as at present, and relieve them of any fire in stoves when cars are connected in the train. They will also adopt a uniform coupler for the pipes between coaches, which will enable cars to run through over the various roads of the country. The system was put at work on May 2 on the 3 o'clock express over the New York, New Haven & Hartford and New York & New England roads.

Mr. Frank M. Wilder, the late Superintendent of Motive Power of the New York, Lake Erie & Western, will be the Engineer and General Manager of the new company. It will be noticed that this company is the first to propose a method of heating cars from the engine, by which existing stoves and pipes are utilized, and can be used when the steam from the engine is not available.

Master Car-Builders' Association.

The following circular has been sent to members of the Association: Your committee to report on the best form of car roof, at the annual convention to be held June, 1887, would respectfully ask your assistance in making up their report by giving them such facts as you may have referring to car roofs, particularly as to the name, plan of construction, material and amount used, cost of labor and material, average life, and any other information bearing on the subject that you may deem valuable.

They would kindly remind you that the value and importance of their report will depend largely upon your assistance in this way.

They will be pleased to receive your reply if possible not later than May 15, 1887. Address to the Chairman.

J. D. McILWAIN, Chairman,
G. T. R., London, Ont.

THE SCRAP HEAP.

The "Asiatic Limited."

It is given out, on the authority of Union Pacific officers, that the new Pullman "vestibule" train, just built for the Pennsylvania's New York and Chicago limited, is to be run through to San Francisco, connecting at New York with European steamers, or as often as the through business warrants. The reports say it will be run weekly or fortnightly.

Strike.

A strike of 13,000 coke handlers, affecting the entire region was inaugurated in Connellsville, Pa., on May 4. The loss of coke alone will be from \$50,000 to \$75,000.

Stealing Rides.

The New York, Lake Erie & Western intends to stop the growing system of ride stealing along its line. Last week it had policemen stationed along the track with instructions to flag the trains and arrest all persons seen riding unlawfully. The result was that 5 arrests were made at Corning, N. Y.; 5 at Elmira, 8 at Owego, 15 at Waverly and 18 at Sayre. All pleaded guilty in court and were fined.

A Literary Feller.

One of the new rules of a Western road is that clergy-men making requisitions for half fare tickets are obliged to make affidavit that they are regularly ordained, and are engaged in no other occupation. A certificate was recently received from a preacher at Salina, Neb., who added after the words, "I am engaged in no other business or occupation," the phrase, "But in preaching the unschutable riches of God's Word."

Railroad Projects in Persia.

Official reports from Teheran (Persia) state that Prince Dolgorouki's mission from the Czar to the Shah is expected to result in a complete understanding between Russia and Persia. Russia, it is asserted, proposes in return for an annual subvention to build military roads and a railway connecting Russian Asia with the head of the Persia Gulf, thus bringing Asiatic Russia into direct communication with the British coasts and the outer world.

Literary.

"I would like a pass to Portland, if you please. I believe you are permitted to give passes to the clerical profession?" "Yes; the Inter-state bill gives us that privilege, I believe. You are a member of that profession? Yes? What name? (Writes out the pass and hands it to the applicant with a gracious bow). And where do you preach, Mr. Blande?" "Preach? I don't preach anywhere."

"But you said you were a clergyman."

"Not I. I said I was a member of the clerical profession. Clerk down in Julep's saloon. Call round and see us. Glad to reciprocate. Solong."

St. Peter and St. Paul.

An old Irishman who has worked for the Chicago, Milwaukee & St. Paul for many years, when hearing of Mr. Mitchell's death, without any intention of being facetious, said: "An so 'the old man' is dead. Heaven rest his soul. If he has as much influence with St. Peter as he had with St. Paul he's all right."

Tramps.

John T. Allen, a freight brakeman on the New York, New Haven & Hartford, was knocked from the train just after leaving New Haven one morning last week by four tramps who were stealing a ride. He was seriously injured.

Bridge Works Burned.

The American Bridge Works, Chicago, Ill., were entirely destroyed by fire on May 2. The works comprised six large shops, and covered about five acres. The loss is about \$400,000, chiefly on valuable machinery. Five hundred men are thrown out of work.

A Plucky Conductor.

A Boston & Albany freight train met with a peculiar accident at South Spencer Wednesday afternoon, April 27, causing the death of conductor James A. Du Bois. The trainmen took the engine and 3 cars and went to switching, leaving 11 cars on the main track. It was supposed that the brakes would hold them, but they were suddenly seen dashing back down grade towards East Brookfield. The train hands at once boarded the engine and 3 cars and backed swiftly down in pursuit of the runaway. They overtook them in about a half a mile, and then the difficult task of coupling them on was undertaken, this being the only way of stopping them, unless some one could climb on them and set the brakes. The two detachments struck with such a force that Du Bois saw that the former way would be impossible, so, as he was standing on the car nearest to the runaways, he attempted to leap on them, but his foot slipped and he fell under the car from which he jumped and was horribly mangled by the wheels. The runaways kept on down the track, gaining speed every minute. A following passenger train was due in 15 minutes,

but switchman Corcoran, at East Brookfield (3 miles from where the cars started), described the cars just in season and with great presence of mind rushed to the switch and turned the cars on to a siding. This track was clear and the cars ran to the end, tumbling 20 ft. down a bank, piling one on top of the other in the brook below. The debris spread over the main tracks and it was two hours before the road was clear. —*Springfield Republican*.

Jumbo.

The newspapers say that the Grand Trunk, in settlement for its collision with Jumbo's trunk, has paid F. T. Barnum \$5,000 in money and agreed to transport Jumbo's heirs, successors, administrators and assigns all over Canada the coming summer for nothing. This would seem to indicate that dead elephants are more expensive than live ones. Elephant steaks in the New York restaurants are quoted at \$1.00@1.25 per plate, with extra bread (98 7/10 per cent. air) thrown in, though it may well be that aristocratic blood has something to do with the relative prices; and, moreover, the extremely low rate for steaks by the plate may have been made specially to cultivate this branch of the traffic, which is, we understand, ridiculously small, very much the greater share of inquirers asking for large blocks, meat on the hoof, as it were. The sales of whole elephants for the country east of the Hackensack and south of the Bronx during 1886 were 2,500 per cent. (or more) in excess of those of cut meat of all kinds, including not only steaks, but tusks, ears, trunks, valises, etc.

Old-Fashioned Dividends.

The goose that lays the golden eggs—in this case a large-sized one, though without feathers, to wit, the steamer "Maryland," which transfers cars from the New York, New Haven & Hartford road to Jersey City, has been (not killed, but) sold, it would appear from the complaint of some Boston stockholders of the New York & New England road, who allege that that road's interest in the transfer company, which pays dividends at the rate of 120 per cent. annually, has been sold out to the New York, New Haven & Hartford (the only other shareholder) at par. If the New York & New England managers are going to put their money where it will earn more than 10 per cent. a month the stockholders would like to know about it, so as to invest a few dollars on private account. Even Mrs. Howe's Women's Bank failed to come up to this seductive figure.

Robbed.

The west-bound overland train on the Southern Pacific road was stopped and robbed on April 28, near Tucson, Arizona. The robbers went through the mail and express cars, but did not get more than \$5,000. The passengers were not molested, the robbers uncoupling the engine, baggage and express cars from the rest of the train, and pulling ahead six miles toward Tucson. Here they killed the engine and left it.

RAILROAD LAW—NOTES OF DECISIONS.

Powers, Liabilities and Regulation of Railroads.

In Kentucky it is decided that railroads are liable for county taxes.¹ In the same state the Court of Appeals holds that the statute of 1873, requiring the chief officer of each railroad company in that state to make a return to the auditor of public accounts in July of each year of the length of his road within the state, and providing for the appointment of a board of equalization, to meet annually in a designated month, at a designated place, to receive the returns from the auditor, to ascertain the value of the property, and to equalize and adjust the assessment thereon, and providing, further, for the correction of the taxes so assessed by suit against the officers for the penalties incurred by a failure to pay the taxes levied, or for the recovery of the taxes themselves by action in the courts, is not in contravention of the fourteenth amendment of the Constitution of the United States, as taking the property of the railroad companies without due process of law. Nor is the act repugnant to the provisions of that amendment guaranteeing to all persons the equal protection of the laws, by reason of the fact that, in the legislation of Kentucky on the subject, railroad property, though called "real estate," is classed by itself, as distinct from other real estate, such as farms and city lots, and subjected to different means and methods for ascertaining their value for purposes of taxation, and differing as well from those applied to the property of corporations chartered for other purposes, such as bridge, mining, street-railway, manufacturing, gas and water companies. The Court in this case also rules that while a railroad cannot be taxed by a county to pay the subscription of the same county to aid in its construction, yet, when its franchises have been purchased by a new company, the property of the new company in the county, except such as it acquired by its purchase from the old company, is subject to taxation for the payment of its part of the county's subscription to aid in the construction of the old road.²

In Kentucky it is also held that the Circuit Court has jurisdiction to enjoin County Court from issuing bonds in aid of a railroad, or levying a tax to pay the same, on account of a subscription of stock which was made contrary to law; it appearing that the railroad had not accepted the subscription, or acquired any vested interest in it, and that the duty of the County Court was simply ministerial.³

In Minnesota it is held that a county may maintain an action to enjoin a railroad from laying its road, without authority, along and in a county road in several towns.⁴

The Court of Appeals of New York has again decided—following the Story case—in favor of an abutting owner on the line of one of the New York elevated roads. The Story case, says the Court, has definitely determined the following propositions, viz.:

1. That an elevated railroad, in the streets of a city, operated by steam power and constructed (as to form, equipments and dimensions) like that described in the Story case, is a perversion of the use of the street from the purposes originally designed for it, and is a use which neither the city authorities nor the legislature can legalize or sanction, without providing compensation for the injury inflicted upon the property of abutting owners.
2. That abutters upon a public street claiming title to their premises by grant from the municipal authorities, who at the same time covenant that a street to be laid out in front of such property shall continue forever thereafter for the free and common passage of, and as public streets and ways for, the inhabitants and all others passing and returning through or by them, in like manner as the other streets of the same city now are or lawfully ought to be, acquire an easement in the bed of the street for ingress and egress to and from their premises, and also for the free and uninterrupted passage and circulation of light and air through and over such street, for the benefit of their property situated thereon.
3. That the ownership of such easement is an interest in real estate constituting property, within the meaning of that term as used in the Constitution of the state, and requires compensation to be made therefor before it can lawfully be taken from its owner for public use.
4. That the erection of an elevated railroad, the use of which is intended to be permanent, in a public street, and upon which cars are propelled by steam engines, generating gas, steam and smoke, and distributing in the air cinders, dust, ashes and other noxious and deleterious substances, and interrupting the

free passage of light and air to and from adjoining premises, constitutes a taking of the easement and its appropriation by the railroad corporation, rendering it liable to the abutters for the damages thereby occasioned to their property. And the Court of Appeals in the present case goes further, saying:

"We are of the opinion that no legal difference exists, with reference to the interest acquired by abutting owners in a public street, between that afforded by a title conferred under such a deed as Story had or that acquired through a series of meane conveyances from the original owner whose property was taken by proceedings *in invitum*, instituted by the municipality under a public statute to acquire land for street purposes, which provided that the land thus taken should be held in trust, nevertheless, that the same be appropriated and kept open for or as part of a public street, etc., forever, in like manner as the said public streets, etc., in the said city are and of right ought to be."

Injuries to Passengers, Employees and Strangers.

In Arkansas a person who refused to pay fare was thrown off the car by a brakeman while it was in motion and injured. In a suit against the company, the latter replied that the brakeman had no authority to do as he did. The Supreme Court rules that to prove the authority of the brakeman in this particular case it is enough to show that other brakemen on the road were in the habit of ejecting persons who did not pay fare.⁵

In Texas the Supreme Court decides that where a passenger, after getting upon a train, tells the conductor that he wishes to be put off at a point on the road which was not a regular station, but at which the conductors of the railroad company's trains, to its knowledge, were frequently in the habit of stopping and putting off passengers, and pays the fare claimed for transporting him to that place, and the conductor afterwards refuses to put him off there, and carries him to the next station, there is a violation of the contract of carriage between the railroad company and the plaintiff for which he can recover.⁶

A man drove his wagon into the driveway between the street and the Hoboken ferry slip at Christopher street, New York. He left the horse there untied and went into the water-closet. While he was away the horse became frightened, and, running forward, jumped into the river, no boat being in the slip, and was drowned. The Court of Errors of New Jersey holds that he cannot recover, even though the guard chain, which might have prevented the accident, was not up—a strict application of the doctrine of contributory negligence.⁷

The sleeping car is again in court. A passenger took a seat in the sleeping car, but when the train conductor came around and looked at his train ticket he informed him that he could not ride in the sleeping car and obliged him to go into the ordinary car. The passenger sued the Pullman Company for refusing him accommodation. The Supreme Court of Massachusetts decides that the Pullman Company is not liable for the act of the train conductor, and that the agreement between the railroad and the Pullman Company that only persons with through tickets shall be permitted to purchase sleeping car tickets is legal.⁸

In Iowa a railroad employé, in getting out of the way of a train suddenly started without signal, stepped between the railroad track and a sand-bank two feet distant, and, while there, a quantity of sand fell from the bank, striking him and knocking him against the moving cars, and the wheels of one of the cars ran over his leg and injured him. The Supreme Court holds that he cannot recover damages from the company, for the proximate cause of the injury was the falling of the bank, and not the starting of the train without signal.⁹ Where a locomotive engineer was injured by having his arm broken, in attempting to quickly reverse the lever in order to stop the train after the engine had left the track, the Supreme Court decided that the direct cause of the injury was the company's negligence in failing to keep the track in proper condition, which caused the engine to leave the rails, and required plaintiff to reverse the lever in order to arrest the motion of the train.¹⁰ In Texas a railroad brakeman having alighted to place a switch, attempted to board the caboose, but his foot slipped upon the step, owing to defects in it, and he fell. A wheel passed over his foot and crushed it. The engineer had never been over the road before, and this made the presence of the conductor necessary upon the engine to show him the curves and grades. The brakeman brought an action against the company to recover damages, averring that the inexperience of the engineer, and the absence of the conductor, necessitated the performance of many additional duties by him, and that it was in the performance of these duties that the injuries were received; but the evidence did not disclose any incompetency on the part of the engineer, or that he was guilty of any negligence in moving the train on the occasion. The Supreme Court holds that the railroad is not liable in damages.¹¹

In Kentucky it appeared that a locomotive pushed a box car to the head of a grade, and, after giving the car an impetus forward, the locomotive returned to its starting point, and the car continued onward, at a rapid rate of speed down grade, and without the control of any one, until it ran over and killed the intestate, who was walking on the track, seeking employment in feeding and watering stock loaded in the cars; a portion of the track traversed by the car ran through a town, and persons were in the habit of passing over it by the tacit consent of the railroad. The Court of Appeals thinks the railroad was negligent, and consequently responsible. It is the duty of the engineer in charge of a train to use increased vigilance while the train is moving through a town or city or other place, where pedestrians have, by license or custom, a right to be; and such duty is violated by sending a car forward through a town or other such place, of its own impetus, without any one in charge to control it.¹² In Arkansas a switchman who was injured while uncoupling cars on a dark night on a defective road bed was allowed to recover damages from the company.¹³

In Kentucky, the Court of Appeals decides that, it being customary for the owners of live stock being shipped on railroads to employ others than the servants of the company to feed and water them at stations or stopping places, a person coming on the tracks at such a point, seeking employment of that kind, is not a trespasser.¹⁴

Accidents at railroad crossings must, to judge by the number of cases in the courts during the past few weeks, be on the increase. The New York Court of Appeals affirms verdicts in two cases for injuries at railroad crossings. In both the judgment is put upon the ground that the railroad did not use proper care in warning people.¹⁵ An ordinance of the city of St. Louis requires that, when moving within the city limits, the bells of locomotives shall be constantly sounded, and, if cars or locomotives are backing, a man shall be stationed on the top of the car furthest from the engine, and no freight train shall be moved within said limits without it be well manned, with experienced brakemen at their posts. The Supreme Court of Missouri has just decided that this ordinance does not apply where the employes are engaged in shifting cars in a yard through which there are no street crossings.¹⁶ The same Court in another case holds that under the Missouri statute a *prima facie* case against the company is made when a person suing a railroad company for damages sustained at a crossing of a public road or street by its train shows that neither the bell of the engine was rung nor whistle sounded, as required by the statute; and the

burden of rebutting such *prima facie* case is cast upon the company.¹⁷

In New York a woman, in crossing a railroad of six tracks, upon a village street, was, on the last track, struck and killed by a locomotive on which the bell was not rung nor the whistle sounded. The Court of Appeals decides that, under the facts of the case, if she saw the locomotive it might be inferred that she was ignorant as to which track it was upon; that by its sudden appearance she was called upon to determine whether she should stand still or go in one direction or the other to get over the tracks; that it could not be said, as matter of law, what a prudent person would have done in similar circumstances; that a jury could alone determine what was her duty and how far it was performed; and hence the trial court had no right to decide that she was negligent, and her representatives could not recover damages.¹⁸ In Massachusetts a recovery was denied to a man who was injured while walking on the track. The Supreme Court holds that a trespasser is entitled to very little consideration. He is negligent himself if he does not look out for the locomotive, and no negligence of the railroad—unless it is willful—will make them liable.¹⁹ In Texas, while a man was riding over the track his horse's foot was caught and he stumbled, throwing the rider and injuring him. He recovered a verdict, which the Supreme Court affirms. The negligence here was in laying the planks at the crossing too wide apart.²⁰ In Arkansas, the Supreme Court rules that permitting bushes to grow on the right of way whereby a view of the track is prevented is not negligence.²¹

In Kentucky in an action for killing stock at a crossing, the Court of Appeals rules that the want of air brakes on the trains is not negligence *per se*.²² In the same state it is held that the owner of trespassing stock is not liable for the wrecking of a train which runs over them.²³ In Indiana the Supreme Court again—for the fortieth time we believe—announces that a railroad is not liable for killing stock which goes on its track at a station or siding where it is not obliged to fence.²⁴

- ¹ Louisville & N. R. Co. v. Com. 3 S. W. Rep. 130.
- ² Owensboro & A. R. Co. v. Daviess Co. 3 S. W. Rep. 164.
- ³ Kentucky Union R. Co. v. County of Bourbon, 2 S. W. Rep. 688.
- ⁴ Board of Steamers Co. v. St. Cloud, M. & A. R. Co., 32 N. W. Rep. 91.
- ⁵ Labr v. Metropolitan R. Co. 4 Cent. Rep. 371.
- ⁶ St. L., I. M. & S. R. Co. v. Hendricks, 2 S. W. Rep. 783.
- ⁷ Hull v. East Line & Red River R. Co. 2 S. W. Rep. 831.
- ⁸ Hoboken Land Dev. Co. v. Lally, 4 Cent. Rep. 313.
- ⁹ Lawrence v. Pullman Palace Car Co. 3 N. Eng. Rep. 7254.
- ¹⁰ Haddell v. Burlington, C. R. & N. R. Co. 32 N. W. Rep. 11.
- ¹¹ Knapp v. Sioux City & P. R. Co., 32 N. W. Rep. 18.
- ¹² Tex. & P. R. Co. v. Wisener, 2 S. W. Rep. 637.
- ¹³ Shelby v. Cinn. N. O. & T. P. R. Co. 3 S. W. Rep. 157.
- ¹⁴ Little Rock, M. & T. Co. v. Leverett, 3 S. W. Rep. 50.
- ¹⁵ Shelby v. Cinn. N. O. & T. P. R. Co. 3 S. W. Rep. 157.
- ¹⁶ Byrne v. N. Y. Cent. & H. R. Co. 6 Cent. Rep. 392; Cumming v. Brooklyn City R. Co. 6 Cent. Rep. 394.
- ¹⁷ Bafferty v. Mo. P. R. Co. 3 S. W. Rep. 393.
- ¹⁸ Household v. St. L., I. M. & S. R. Co. 2 S. W. Rep. 794.
- ¹⁹ Sherry v. N. Y. Cent. & H. R. Co. 4 Cent. Rep. 357.
- ²⁰ Barstow v. Old Colony R. Co. 3 N. Eng. Rep. 746.
- ²¹ East Line & Red River R. Co. v. Brinker, 3 S. W. Rep. 99.
- ²² Kansas City, S. & M. R. Co. v. Kirksey, 2 S. W. Rep. 190.
- ²³ Grundy v. Louisville & N. R. Co. 28 S. W. Rep. 899.
- ²⁴ Louisville & N. R. Co. v. Simmon, 3 S. W. Rep. 10.
- ²⁵ Indiana, B. & W. R. Co. v. Sawyer, 7 West. Rep. 550.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

- Chicago, Burlington & Quincy, annual meeting, at Chicago, May 18.
- Delaware & Hudson Canal Co., annual meeting, at the office, New York, May 10.
- Fort Worth & Denver City, special meeting, Fort Worth, Tex., June 22.
- Missouri Pacific, special meeting, at St. Louis, Mo., May 10.
- St. Louis & San Francisco, annual meeting, at St. Louis, Mo., May 11.
- Pitt & Pere Marquette, annual meeting, East Saginaw, Mich., May 18.
- Puget Sound Construction Co., annual meeting, at the office, Seattle, Washington Ter., May 19.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

- Boston & Maine, \$5 per share, payable May 16.
- Pennsylvania, 2½ per cent., semi-annual.

Railroad and Technical Conventions.

Meetings and conventions of railroad associations and technical societies will be held as follows:

- The Master Car-Builders' Club holds its regular meetings at the rooms, No. 113 Liberty street, New York, on the third Thursday in each month.
- The Master Car-Builders' Association holds its annual convention at Minneapolis, Minn., June 14.
- The New England Railroad Club holds its regular meetings at its rooms in the Boston & Albany passenger station in Boston, on the second Wednesday of each month.
- The Western Society of Engineers holds its regular meetings at its hall, No. 15 Washington street, Chicago, at 7:30 p. m., on the first Tuesday of each month.

American Society of Mechanical Engineers.

This organization will hold its spring meeting for 1887 in Washington, D. C., beginning May 31, and ending June 3. The following papers are to be presented and discussed:

- Samuel Webber, "Tests of the Comparative Value of Different Kinds of Belting;" L. H. Rutherford, "Should a Piston Packing Ring be of the Same Thickness at Every Point;" John T. Hawkins, "The Education of Intuition in Machine Designing;" R. H. Thurston, "Systematic Testing of Turbines in the United States;" Charles E. Emery, "Notes for Discussion on the Limit of Steam Pressure in Marine Engines;" Charles E. Emery, "Notes for Discussion on Cylinder Condensation;" Albert Stearns, "A Method of Evaporation by Means of Exhausted Steam;" Henry R. Towne, "Methods of Determining Cost and Distribution of Power and Heat;" Wm. Kent, "A Problem in Profit Sharing;" Chas. E. Emery, "Comparative Value of Steam and Hot Water for Transmitting Heat and Power;" Thos. S. Crane, "Direct Acting Steam Veneering Cutter;" H. A. Ramsay, "What are the Needs of our Navy?" R. H. Thurston, "Notes on Helical Seams in Boiler Making;" Jos. Morgan, Jr., "National Defense, and the Mechanical Problems which it Involves;" Geo. H. Babcock, "A New Method of Making Tubes from Solid Bars."

Master Car-Builders' Association.

The 21st annual convention of this Association will be held in Minneapolis, Minn., beginning June 14. The following is a list of the subjects which are to be under discussion during the sessions of the convention: 1. Standards and appliances for the safety of trainmen. 2. British and continental

practice in matters of interest to the Master Car-Builders' Association. 3. Automatic freight car brakes. 4. The comparative advantages of the two methods of constructing freight cars with and without platform timbers or end sills projecting from the end of the car. 5. Maximum outside dimensions of freight cars. 6. Standard draw-gear for non-automatic couplers. 7. Appliances to prevent the slipping of wheels, both passenger and freight. 8. Standard freight-car truck and axle for cars of 60,000 lbs. capacity. 9. Standard sizes of lumber for freight cars. 10. The best form and construction of car roofs.

Railroad Brakemen to Convene.

The fourth annual Convention of the Grand Lodge of Brotherhood of Railroad Brakemen will be held in Binghamton, N. Y., on Oct. 18.

Association of Engineering Societies.

At a meeting of the Board of Managers held in Chicago April 15 and 16, 1887, provision was made to continue the publication of the *Journal of the Association* as heretofore.

The application of the Engineers' Club of Kansas City to become a member of the Association was granted, thus making seven societies now in the Association. [The societies now composing the Association are the Boston Society of Civil Engineers, Engineers' Club of St. Louis, Western Society of Engineers (Chicago), Civil Engineers' Club of Cleveland, Engineers' Club of Minnesota (Minneapolis), Civil Engineers' Society of St. Paul, and Engineers' Club of Kansas City].

The following address to the societies now in the Association was adopted, and the chairman was directed to send a copy of it to each society in the Association:

The Association of Engineering Societies was organized some six years ago, its primary purpose being the joint publication of the transactions of the various engineering societies of the country. The movement was looked upon with forebodings by many, while others hoped that the habit of co-operation thus inaugurated would ultimately lead to a broader and closer union, national in its scope. The Association originally comprised the societies and clubs located at Boston, Cleveland, Chicago and St. Louis, with an aggregate membership of about four hundred.* The success attending the Association and the enviable status of its publication give abundant promise of permanence and of future growth.

The Board of Managers has always been disposed to encourage fuller co-operation, believing that there was a growing desire among engineers for a comprehensive organization which should represent them as a whole and as a profession. The efforts recently made in this direction do not seem to be fruitful in results, and we venture to ask that the societies in this Association, and all others interested, consider the advisability of taking steps which may lead to a national organization. If this shall appear desirable it would seem best to appoint delegates who may meet and discuss the many questions which must be settled before such an organization can be perfected.

In the absence of any authority which can act as intermediary, the Board offers its services in obtaining the sense of the several societies of the country, and in any other way in which it may aid in this very desirable action. If the societies of the Association favor such a movement, the Board respectfully suggests that it be empowered to issue a call and arrange for a convention.

In order to arrive at a conclusion in a practicable manner, the following specific proposition is submitted for the consideration of the societies in the Association.

Proposed Action of Societies.

Article 1. The (here insert name of society or club) authorizes the Board of Managers of the Association of Engineering Societies, on the favorable action of two-thirds of the societies in the Association, to call a convention of delegates from the several societies of the Association, and such other societies as the Board may invite, said convention to consider the question of an organization of the several societies of the country in a confederation or such other union as may be found desirable. The Board is also empowered to lay before this convention such other matters as it may consider of general moment.

Art. 2. The Board of Managers may determine the time and place for such a convention. The representation of each participating society shall be three votes and one additional for each fifty or fraction thereof in excess of one hundred members.

Art. 3. The conclusions of this convention shall not be binding upon any participating society until ratified by said society, and when two-thirds of the participating societies have ratified the action of said convention the proposed organization may go into effect.

PERSONAL.

—L. A. Bowers, who has been Superintendent of the Wilmington & Northern Railroad for the last 17 years, has resigned his position.

—S. T. Smith has resigned the position of General Superintendent of the Union Pacific to become General Manager of the Denver & Rio Grande.

—John S. Garland, formerly General Passenger and Ticket Agent of the Indianapolis & Terre Haute, died suddenly in Denver, Col., last week.

—J. O. Phillips has resigned as Assistant General Freight Agent of the Atchison, Topeka & Santa Fe to accept the Presidency of the Topeka Land & Investment Co.

—G. L. Marble has resigned the position of Assistant to the General Manager of the Cincinnati, Jackson & Mackinaw, in order to become General Attorney of the company.

—It is reported that A. C. Dawes, General Passenger Agent of the Hannibal & St. Joseph, has been offered the position of General Manager of the Oregon Railway & Navigation Co.

—Judge J. P. Usher, General Attorney for the Missouri Pacific in Kansas, has resigned his position and retired to private life. He is the sole survivor of President Lincoln's Cabinet.

—Albert Keep is to retire from the Presidency of the Chicago & Northwestern. He has said this week that his determination to do this is final. He has been President of the company for 14 years.

—Benjamin S. Le Van died at Coplay, Pa., on May 2, aged 80 years. He was one of the pioneers in the iron business, and for 30 years was the Manager and Superintendent of the works of the Coplay Iron Co.

—W. S. Jackson has resigned as President of the Denver & Rio Grande road. At a meeting of directors in Denver, Col., this week, resolutions were adopted thanking Mr. Jackson for his creditable and efficient management since the re-organization of the road.

—William M. Durfee, who has been General Passenger and Ticket Agent of the Providence & Worcester road for more

* Three other societies have since joined and the total membership has nearly doubled.

than 20 years, has been retired, and his duties transferred to the Superintendent's department. Mr. Durfee entered the service of the company 30 years ago.

—J. F. Goddard, the new General Manager of the Atchison, Topeka & Santa Fe system, was born in Brockton, Mass., where he was educated and lived until 1862, when he went to the war and served till its close. He continued in the quartermaster department of the army till 1868, when he went to Chicago and entered the General Freight office of the Chicago, Burlington & Quincy. In 1871 he was appointed Assistant General Freight Agent of the Burlington and in 1878 he went with W. B. Strong to the Atchison system as General Freight Agent. In 1882 he was appointed Traffic Manager and in 1885 Assistant General Manager.

ELECTIONS AND APPOINTMENTS.

Atchison, Topeka & Santa Fe.—J. F. Goddard has been appointed General Manager, with jurisdiction over this and the Southern Kansas roads. W. F. White is promoted to the position of Traffic Manager.

Atlantic & Pacific.—W. F. White is appointed Traffic Manager, with headquarters at Topeka, Kan.

Baltimore & Ohio.—A. J. Cromwell has been appointed Superintendent of Motive Power for all lines east of the Ohio River; A. Hunter Johnson, Engineer of Maintenance of Way for the main stem and branches; headquarters at Baltimore. W. H. Harrison has been appointed Superintendent of Motive Power for the trans-Ohio divisions, and David Lee Superintendent of Maintenance of Way; headquarters at Newark, Ohio. A. Gordon Jones has been appointed Superintendent of the Harper's Ferry & Valley Division, vice A. H. Johnson, promoted.

Baltimore & Western.—The incorporators are Henry G. Davis, Stephen B. Elkins and Thomas B. Davis, of Mineral County, West Virginia, and Edwin W. S. Moore, Wm. J. Read, Wm. H. Gorman and Wm. Pinkney Whyte, of Maryland.

California Southern.—W. F. White is appointed Traffic Manager, with headquarters at Topeka, Kan.

Canadian Pacific Despatch Freight.—B. D. Webber is appointed General Eastern Agent, at Boston.

Catawissa.—The following officers were elected this week: President, M. P. Hutchinson; directors, I. V. Williamson, Emmet Weaver, George C. Carson, Edwin S. Buckley, F. K. Shipper and John S. Graham.

Central Ohio.—At the annual meeting of this company, as reorganized, the following directors were elected: James H. Collins, Walter R. Brooks, John R. Hall, Daniel Applegate, Joseph W. Jenkins, Joshua G. Harvey, C. H. Kibler, Samuel Spencer, Osman Latrobe, R. T. Devries, Orlando Smith, W. W. Peabody, David Lee.

After the election the Board met and organized by the election of the following officers: J. H. Collins, President; William H. Ijams, Secretary; and Daniel Applegate Treasurer.

Chartiers.—The election this week resulted as follows: President, G. B. Roberts; directors, Alexander Biddle, J. N. Dubarry, William L. Elkins, Wistar Morris, N. Parker Shortridge and Edmund Smith.

Chicago, Kansas & Nebraska.—George McFadden has been appointed Traveling Freight Agent, with headquarters at Topeka, Kan.

Chicago, Kansas & Western.—J. F. Goddard is appointed General Manager, vice C. W. Smith, resigned. W. F. White is appointed Traffic Manager.

Chicago, Milwaukee & St. Paul.—Frank S. Bond has been made Acting President in place of the late Alexander Mitchell.

Cincinnati, Jackson & Mackinaw.—F. S. Anable has been appointed Assistant to the President, and also Comptroller, with office at Toledo, O. O. A. Wilson has been appointed Acting Auditor and Cashier.

Cleveland & Northwestern.—Donald McNaughton, of Rochester, N. Y., has been elected President of this new company.

Denver & Rio Grande.—David H. Moffatt has been chosen President in place of W. S. Jackson, resigned. S. T. Smith has been appointed General Manager. Walter S. Cheeseman has been chosen a director to fill the vacancy caused by Mr. Jackson's resignation.

Dover & Barrington.—At the annual meeting in Dover, N. H., the following directors were elected: John Holland, Henry Law, Winfield S. Bradley, Arthur G. Whittemore, Joshua Converse, Washington Anderton, J. Herbert Seavey, all of Dover.

Duluth, South Shore & Atlantic.—Livingston J. Little has been made a Division Engineer in charge of construction.

East Brandywine & Waynesburg.—At the annual meeting the following officers were elected: President, John Conroy; directors, T. M. Storb, Amos Dillon, B. F. Kinser, J. N. Dubarry, Wistar Morris, G. B. Roberts, James McClune, Edmund Smith, N. P. Shortridge, John P. Green, Henry D. Welsh and Joseph C. Davis.

Erie Express.—T. L. Clark has been appointed General Agent at Chicago in place of William W. Chandler, Jr., who has been promoted to General Manager.

Fitchburg.—Under the consolidation with the Troy & Boston three new directors are added to the Fitchburg board, viz., Daniel Robinson, Frederick L. Ames and George Haywood.

International Association of Car Accountants.—At the recent convention in Atlanta, Ga., the following officers were elected: President, T. J. Hoyle, East Tennessee, Virginia & Georgia; Vice-President, E. C. Spalding, Western & Atlantic; Secretary, H. H. Lyon, Chicago & Alton; Executive Committee, W. A. Moody, Richmond & Danville; G. J. Cook, New York, Lake Erie & Western; W. G. Wattson, West Shore.

Jamesburg Agricultural.—Directors, W. H. Wilson, Edmund Smith, J. N. Dubarry, Louis Perrine, C. B. Oviatt, Hal Allaine, Henry D. Welsh, C. D. Simms, James R. McClure, W. D. Sewell, W. N. Bannard; President, W. H. Wilson; Secretary, James R. McClure; Treasurer, Dr. Taylor.

Kansas & Arkansas Valley.—The following directors have been elected: Jay Gould, George J. Gould, A. L. Hopkins, S. H. H. Clark, Henry Wood, C. F. Penzel, W. M. Fishback, Jesse Turner, and Thomas Essex. The officers elected are: George J. Gould, President; Henry Wood, Vice-President; A. H. Calef, Treasurer; A. J. Lamborn, Secretary.

Lewisburg & Tyrone.—At the annual meeting this week the following officers were elected: President, J. N. Dubarry;

directors, G. B. Roberts, Edmund Smith, Wistar Morris, Eli Stifen, James F. Coburn and S. C. Stewart.

Little Rock & Fort Smith.—The following directors have been elected: Jay Gould, George J. Gould, A. L. Hopkins, S. H. H. Clark, Henry Wood, C. F. Penzel, W. M. Fishback, Jesse Turner and Thomas Essex. The directors have elected George J. Gould, President; Henry Wood, Vice-President; A. H. Calef, Treasurer, and C. F. Shillaber, Secretary.

Little Rock Junction.—The following have been elected directors: Jay Gould, George J. Gould, A. L. Hopkins, S. H. H. Clark, Henry Wood, C. F. Penzel, W. M. Fishback, and Jesse Turner. The officers elected are: George J. Gould, President; Henry Wood, Vice-President; A. H. Calef, Treasurer; C. F. Shillaber, Secretary.

Long Branch.—Directors, Edward Smith, W. J. Sewell, G. M. Dorrance, William Bettle, C. T. Parry, R. B. Gowdy, B. F. Archer, W. D. Bailey, D. E. Culver, C. S. Ridgway, J. N. Dubarry, H. D. Welsh and J. P. Wetherill; President, W. J. Sewell; Secretary and Treasurer, Dr. Taylor.

Louisville & Nashville.—Harvey Middleton has been appointed Superintendent of Machinery in place of Reuben Wells, who has resigned. The office of Assistant Superintendent of Machinery has been abolished.

Mexican Central.—At the annual meeting in Boston this week the following directors were elected: Oliver Ames, Isaac T. Burr, Sebastian Camache, Jacob Edwards, Pablo Landa, A. B. Laurie, L. J. Leiter, E. Rollins Morse, Albert W. Nickerson, Joseph Richardson, of New York; William Rotch, E. W. Jackson, Warren Sawyer, Robert R. Symon, J. H. White, G. B. Wilbur and Levi C. Wade.

Mississippi River & Northwestern.—W. B. Dutton has been elected General Manager.

New York Central & Hudson River.—William James has been appointed Foreign Freight Agent at New York in place of W. H. McIlhenny, resigned.

New York, Chicago & St. Louis.—At the annual meeting in Cleveland, O., this week, D. W. Caldwell, Charles Hickox and J. H. Wade, of Cleveland, and Allyn Cox, of New York, were elected directors for a term of three years.

New York, New Haven & Hartford.—J. N. States, heretofore ticket agent at New Haven, has been appointed General Ticket Agent, with office at New York. Isaac Bromley is appointed Advertising Agent.

H. M. Kochersperger has been appointed Controller, with headquarters at New Haven, Conn.

New York, Wheeling, St. Louis & Chicago.—The following directors have been elected: J. E. Williams, Ezra G. Hayes, John C. Hooven, Henry Sohn, G. A. Reutschler and E. A. Belden. Henry Sohn has been elected President and Edgar A. Belden Secretary and Treasurer of the Ohio branch of the road.

Norfolk & Western.—At the annual meeting in Roanoke, Va., this week, the old officers and directors were re-elected.

Oregon & Washington Territory.—W. F. Griffith has been elected Vice-President.

Park Point Terminal & Transfer.—The incorporators of this new Minnesota company are: R. W. Petre, R. P. Edson, John J. Hibbard, Henry H. Bell, Wallace Warner, Bernard Silberstein, Duluth; R. H. Palmer, Park Point; R. H. Hartley, John B. Atwater, Minneapolis; Stephen Van Wyck, St. Paul, Minn.

Philadelphia & Atlantic City.—At the annual meeting this week the following elections were made: President, Austin Corbin; directors, George de B. Keim, S. A. Caldwell, Albert Foster, S. Garwood, J. A. Bodine and Woodward Warwick.

Philadelphia Midland.—The election this week resulted as follows: President, W. H. Barnes; Directors, A. F. Burchell, Lewis Neilson, George E. Peabody, H. P. Rutter, William Sellers and B. H. Taylor.

Pittsburgh, Cincinnati & St. Louis.—Frank Dickerson has been appointed Division Freight Agent at Cincinnati, O., vice Mr. Fuller, resigned.

Pittsburgh & Lake Erie.—Elliot Holbrook, formerly Superintendent of the Eastern Division of the New York & New England, has been appointed Chief Engineer of the Pittsburgh & Lake Erie.

Pomeroy & Newark.—The following directors have been elected: W. H. Wilson, Edmund Smith, J. N. Dubarry, J. P. Wetherill, Henry D. Welsh, Wistar Morris and N. P. Shortridge.

Reading, Marietta & Hanover.—The election this week resulted as follows: President, Austin Corbin; Secretary, Howard Hancock; Treasurer, John Welch; directors, Austin Corbin, George de B. Keim, S. A. Caldwell, A. J. Antels, Thomas Cochran and John Wanamaker.

St. Louis & Chicago.—L. S. Graves has been appointed Superintendent, vice A. G. Kleiback, who has resigned to take charge of the company's extension.

St. Louis & San Francisco.—F. D. Bussell has been appointed Assistant General Freight Agent, vice S. R. Taylor, who has resigned on account of ill health, office at St. Louis. Carl Gray has been appointed Commercial Agent, with headquarters at Wichita, Kan.

Shamokin Valley & Pottsville.—The election this week resulted as follows: President, G. B. Roberts; directors, Wistar Morris, J. N. Dubarry, A. J. Cassatt, Edmund Smith, John P. Green and N. P. Shortridge.

Sunbury, Hazleton & Wilkesbarre.—The election this week resulted as follows: President, J. N. Dubarry; directors, A. J. Cassatt, Wistar Morris, G. B. Roberts, Edmund Smith, Henry D. Welsh and J. Price Wetherill.

Tyrone & Clearfield.—The election this week resulted as follows: President, J. N. Dubarry; directors, John P. Green, Wistar Morris, G. B. Roberts, N. Parker Shortridge, Edmund Smith and Henry D. Welsh.

Ulster & Delaware.—N. A. Sims has been appointed General Freight and Passenger Agent of this road and of the Kaaterskill road.

Valley.—A. Gordon Jones has been appointed Superintendent, with headquarters at Winchester, Va.

Vicksburg & Meridian.—The following directors have been elected: Edward R. Bacon, Frank S. Boz, C. C. Harvey, Rush C. Hawkins, Isaac P. Martin, Charles Schiff, Alfred Slidell.

Wabash.—David W. Rider has been appointed Chief Clerk to Receiver McNulta.

West Virginia Central.—At the annual meeting in Baltimore last week, the following directors were elected: Henry

G. Davis, A. P. Gorman, S. B. Elkins, W. H. Gorman, W. Pinckney White, G. W. Harrison and E. W. S. Moore. Mr. Gorman was chosen President and Maj. E. W. S. Moore Secretary.

Williamstown & Delaware River.—Austin Corbin was elected President this week. The directors are George de B. Keim, S. A. Caldwell, Albert Foster, S. Garwood, J. A. Bodine and Woodward Warwick.

Wilmington & Northern.—F. B. Hibbard has been appointed Superintendent in place of L. A. Bowers, resigned.

OLD AND NEW ROADS.

Baltimore & Western.—Incorporated in Maryland. The road to be built will run from Cumberland to Hagerstown. It will give connection with Baltimore by the Western Maryland road, and with Harrisburg, by the Cumberland Valley road. The line has been surveyed. There will be two tunnels of 1,100 ft. each. Capital stock of company, \$2,000,000, divided in 40,000 shares of \$50 each.

Boston & Maine.—This company has leased the Northern Railroad, which runs from Concord, N. H., to White River Junction, Vt., 69½ miles, with a branch of 13½ miles. The lease is for 99 years, and the Boston & Maine guarantees payment of 5 per cent. for the first 10 years and 6 per cent. for the remaining 89 years. The lease goes into effect July 1 next.

Boston, Rev. Beach & Lynn.—The company is rebuilding and extending the old Boston, Winthrop & Shore road. The road bed has been entirely relocated, the extension consisting of about two miles of new track through the centre of the town of Winthrop, Mass., and terminating at Great Head. Another line of about two miles will also be built connecting with the line from Winthrop Junction and crossing the Great Head track, with a terminus at Point Shirley, thus forming a loop line. The new lines will be in operation about June 1.

Buffalo, Rochester & Pittsburgh.—The company is now having built 800 box-cars and 17 locomotives. It is preparing to open a new coal mine at Beech Tree, Jefferson County, Pa. A thousand new coke ovens are to be built at the Adrian mines. The whole number of coke ovens at these mines will be about 1,500.

California & Oregon.—The bridge over the Klamath River, in northern California, is completed, with 7 miles of track laid north of the river.

Canadian Pacific.—It is reported that negotiations are pending with the Michigan Central for a traffic agreement by which this company can reach Detroit and Chicago. The Canadian Pacific threatens to build west from St. Thomas, Ont., unless it can secure favorable terms from the Michigan Central, while on the other hand, the Boston & Albany people appeal to the Vanderbilt interest to protect them from Canadian Pacific competition in New England, on the ground that the offensive and defensive alliance between the Boston & Albany and New York Central which was made several years ago is still in force.

This company's first steamer on its new line left Yokohama on April 20 with a cargo of tea and silk for Liverpool. She is expected to arrive at Port Moody, B. C., about May 18. It is reported that this company is negotiating for the control of the entire property of the Boston & Maine.

Central Iowa.—There will be a meeting next week of the security holders of this road who are opposed to the proposed plan of reorganization. The meeting is called by Elijah Smith.

Central of New Jersey.—There were 31 employés discharged this week, including train dispatchers, yard-masters, car inspectors, etc. The cause is said to be a desire on the part of the officers of the company to reduce expenses.

Chautauqua Lake.—The first spike was driven in this road on May 2. The road is to connect the New York, Lake Erie & Western at Jamestown, N. Y., with the Lake Shore & Michigan Southern at Westfield, N. Y.

Chicago, Burlington & Quincy.—The company is to build a club house at Grand Crossing, Ill., for its employés. The structure will have billiard, card and reading rooms, with sleeping apartments, closets, baths, etc. It will be supported by a system of assessments.

Chicago, Rock Island & Pacific.—The company is to build from Horton, Kan., straight west, running the line through the county seat of each county in the northern tier of Kansas counties, beginning at Doniphan County on the Missouri River, and passing through Brown, Nemaha, Marshall, Washington, Republic, Jewell, Smith, Phillips, Norton, Decatur, Rawlins and Cheyenne counties. This will give almost an air line from St. Joseph to Denver, Col. The Chicago, Kansas & Northern Railroad already constructed northwest through Beatrice, Hastings and Hebron and Fairfield, Neb., to Nelson, will be continued into the far Northwest country. A branch for this northwestern line will be constructed southwest from Fairbury, Neb., or some point near there, to Mankato, county seat of Jewell County, connecting at the latter place with the Denver line.

Cleveland & Canton.—The long-standing dispute between the two factions of this company is said to have been amicably settled. A contract has been entered into between Mr. Parlin and representatives of the Blood party. Mr. Parlin, for the Corbin interest, agreed to buy or sell preferred stock at 85, with the provision that all the friends of either party could participate if they desired. The Blood interest elected to buy, and all trouble consequently ceased.

Columbus, Lima & Northwestern.—Two corps of engineers began the survey of this road last week, one working from Defiance to Lima, O., and the other from Lima to Columbus, O.

Delaware & Otsego.—Organized in Kingston, N. Y., for the purpose of building a road from Hobart to the present terminus of the Ulster & Delaware road at Oneonta, on the Susquehanna Division of the Delaware & Hudson. It is practically an extension of the Ulster & Delaware.

Detroit, Lansing & Northern.—The company is to build a branch from Lansing to Grand Rapids, Mich. The contract is let for a bridge over Grand River at Grand Ledge. This bridge will be 800 ft. long and about 60 ft. from the water, and it is located at a very romantic part of the river.

Duluth Iron Range.—A syndicate of Chicago and New York capitalists, headed by H. H. Porter, is negotiating for the purchase of this road and the Minnesota Iron Company's property.

Fitchburg.—The purchase of the Boston, Hoosac Tunnel & Western road by this company was consummated on April 30. The road is 61 miles long extending from the Massachusetts state line to Rotterdam Junction, N. Y., where connection is made with the West Shore road. It leases branches to Saratoga and Schuylerville, 27 miles. The statement is

made that the Continental Construction & Improvement Co. is to dispose of its interest in the Boston, Hoosac Tunnel & Western to the Fitchburg for \$2,900,000 Fitchburg preferred stock and \$2,000,000 of common stock. The Fitchburg assumes the payment of \$1,400,000 Boston, Hoosac Tunnel & Western 5 per cent. debenture bonds outstanding and will call them in at once. That company will in addition set aside \$700,000 preferred stock, into which the \$2,800,000 common stock of the Boston, Hoosac Tunnel & Western can be exchanged one share for four.

Another account says \$2,000,000 of Fitchburg 4 per cent. bonds are to be applied in payment. The road is said to have earned \$78,000 over fixed charges last year; but with the new owners this road and the Troy & Boston must doubtless be regarded as one system, so far as earnings are concerned, so that this item has very little meaning. The Fitchburg takes possession of the Boston, Hoosac Tunnel & Western June 1. This purchase doubtless ends all the schemes for building the Williamsburg & North Adams or extending the Deerfield River road.

The stockholders met last week and ratified the agreement for the consolidation of this company with the Troy & Boston. President Phillips, of this company, and Secretary Vail, of the Troy & Boston, have been served with injunctions restraining them from carrying into effect the proposed consolidation of the two roads. The Fitchburg took possession of the Troy & Boston on May 3. The articles of agreement were not filed, and orders were obtained by one of the holders of Troy & Boston consolidated bonds directing the Secretary of State to show cause why he should not be restrained from receiving the certificates of consolidation.

Fort Worth & Denver City.—The track is laid to a point 50 miles beyond Quanah, Tex., and the contractors say that from now they expect to construct 50 miles of road every month. By May 20 the track will be across Red River, the bridge put in and everything ready to work on toward the Canadian River.

Grand Rapids & Indiana.—The company is building new depots at Big Rapids and Petoskey, Mich., and with the Michigan Central is having built a large ferry boat to run between Mackinaw and St. Ignace, and transport cars across the Straits of Mackinaw.

Grand Trunk.—At the semi-annual meeting in London, last week, the President of the company, Sir Henry Tyler, said that the directors should now consider the question of doubling the tracks, and proposed that £100,000 be at once expended on the beginning of the work, and that £100,000 more be appropriated for other improvements. There was no reason, he said, to fear the competition of the Canadian Pacific while the rates were maintained as at present. He said the prospects of the Grand Trunk were never so hopeful as they are now.

Gulf & Ship Island.—The road is to be completed at once from Cotton Plant to Pontotoc, Miss., 25 miles. This will give a line from Middleton, Tenn., on the Memphis & Charleston road, to Pontotoc.

Helena, Boulder & Madison.—Articles of incorporation filed in Montana. The road is to run from Helena to Boulder, thence down Boulder River through the valley of the same to the junction with Jefferson River, thence to Red Bluff, on the Madison River, thence up the river into the National Park. The distance from Boulder to Red Bluff is 54 miles. The object in constructing the line is to tap the ore regions of Madison County.

Helena, Boulder Valley & Butte.—The company has increased its capital stock \$1,000,000, and is to be constructed at once to Butte, Montana. Tracklaying commenced last week.

Helena, Gallatin & National Park.—Articles of incorporation filed in Montana. From a point on the Northern Pacific in Montana the road will run southward to the National Park and will connect with the Helena, Boulder & Madison at Red Bluff.

Kansas City, Memphis & Birmingham.—A year's work on this road is reported as follows: 370 miles of preliminary surveys, 290 miles location, 950 acres right of way cleared, 1,758,500 cubic yards of earth excavation, 174,100 cubic yards of loose rock excavation and 149,000 cubic yards of solid rock excavation completed, 11,500 cubic yards of masonry built, 2,160,000 ft. board measure of trestle work built, 51,500 lineal ft. of piling driven, and 345,000 cross ties cut and delivered. The work was done under Chief Engineers Grant and Elliott, and the immediate supervision of A. W. Gloster, Assistant Engineer. The work was in Alabama, west of the Big Warrior River. The contractors engaged were: Garvey & Lee, 18 miles; Fudge & Kearns, 12 miles; Reese Thomas, 6 miles; M. J. Condon & Co., 32 miles; Price & King, 12 miles; Gibson & Corpening, 6 miles; W. G. & L. H. Corpening, 4 miles; James H. Sullivan, 8 miles; McDonald & Shea, 4 miles; J. W. Marsteller & Co., 9 miles; John Nolan, 4 miles; total, 115 miles. All grading will be completed, and tracklaying commenced at Tupelo, on the west side of the Big Warrior River by May 15. The company is now building a connecting track between its road and the Georgia Pacific, near Cordova, Ala.

Maricopa & Phoenix.—The road is completed 4 miles north of the Gila River from Maricopa, Ariz.

Meriden & Cromwell.—The citizens of Waterbury, Conn., have subscribed \$125,000 for extending this road from Meriden to that city. Meriden and the railroad company guaranteed the additional money required. Work is to begin at once.

Mexican National.—It is reported that the officers of this company have made financial arrangements in England which will enable them to resume at once the construction of the branches. Work will continue without interruption upon the Guadalajara branch, and it is thought that the 162 miles will be finished and in operation by May of next year.

Michigan & Ohio.—The formal transfer of the Cincinnati, Jackson & Mackinaw to the above company has been filed in Ohio. The purchase was made for \$550,000 cash, \$5,028,000 in preferred and \$10,056,000 in common stock of the Cincinnati, Jackson & Mackinaw.

Milwaukee & Northern.—There are now 1,500 men at work on the Republic extension of this road between Republic, Mich., and Iron Mountain, Wis.

Minneapolis, Sault Ste. Marie & Atlantic.—Sander's Point, Mich., is to be the terminus of the extension of this road. It is 5 miles north of Escanaba, and has a harbor with 20 ft. of water. The company intend building there two commercial docks, two ore docks and a coal dock. The road will be finished to Sander's Point this year.

Missouri Pacific.—A. K. Robinson and his force of engineers have completed the survey of the Jefferson City branch of this road between Jefferson City and Carthage, Mo. The work was done in 6 weeks. The new line intercepts the Jefferson City, Lebanon & Southwestern branch near Aurora Springs, Miller County, and the branch, which is a

part of the Missouri Pacific, will be used from that point to Jefferson City.

On May 1 the Little Rock & Fort Smith, the Kansas & Arkansas Valley, the Little Rock Junction and the Little Rock, Mississippi River & Texas roads passed into control of the Missouri Pacific, which company will now operate them.

It is reported that Jay Gould has bought 168 acres of land just south of Carondelet Park in St. Louis. The land was bought for a manufacturing site where the machine shops of the Missouri Pacific and the St. Louis, Iron Mountain & Southern are to be consolidated.

The company has accepted the proposition of the city of Atchison, Kan., for the location of its shops there. The shops will be built on the 80 acres of land owned by the company. Work will begin on them July 1. They will cost \$250,000, and will employ from 1,000 to 1,500 men.

Mobile & Dauphin Island Railroad & Harbor Co.—A new company to be known by this name will build 36 miles of road from Mobile, Ala., to Dauphin Island.

Monroe & Atlanta.—Wright & Co. have begun work on this road between Monroe, N. C., and Atlanta, Ga.

Montreal, Portland & Boston.—The case involving the ownership of the capital stock of this company purchased two years ago in the interest of the Vermont National Bank has been decided in favor of the bank.

New Roads.—A road is to be built between Arcadia and Monrovia, Cal., 1½ miles. Grading was begun last week.

There is to be a road built between Nevada, Mo., and Eldorado Springs, 20 miles.

Governor Hauser is arranging to build a branch from the Northern Pacific, in Gallatin County, Montana, to his coal mines in that state.

The work on the road being constructed from Tulancingo to Tooleycuan, State of Hidalgo, Mexico, is in an advanced state, and it is expected that in about 3 months the road will be completed.

New York Central & Hudson River.—This road is to connect with the West Shore just east of Utica, N. Y. The connecting branch will be about 2,200 ft. long.

New York, Rutland & Montreal.—There was a fight at Petersburg Junction, N. Y., on May 2, between the present manager of this road and the former receiver, W. Y. Reynolds. It was decided sometime ago that the road, which was formerly known as the Lebanon Springs road, had never been legally sold by the old syndicate to the new, and it was ordered back into the hands of the old receiver. Accordingly Mr. Reynolds undertook to resume possession, but he and his party were driven away from the property by Superintendent Roberts and his employés. The Reynolds people tore up about a half mile of the track and did other damage to the road. A posse of deputy sheriffs was summoned from Troy, and they soon arrived on the scene and took charge of affairs. On May 3 the rolling stock of the road was run into the state of Vermont so that the receiver appointed in New York would be unable to take possession of that part of the property.

Ohio Valley.—The road was completed last week from Henderson to Marion, Ky.

Pacific.—The Pacific Railroad Commission sat in New York on April 27, 28 and 29. At the first day's session C. P. Huntington was examined on the history and affairs of the Central Pacific, Southern Pacific and dependent lines. On the second and third days Charles Francis Adams gave his testimony in regard to the Union Pacific and its branches. The commission resumed its sessions on May 4. On that day Artemas H. Holmes, special counsel for the Kansas Pacific road, was examined, and his testimony was continued on May 6.

Park Point Terminal Transfer.—Incorporated in Minnesota to build a road in St. Louis and other counties. Capital stock, \$500,000.

Pennsylvania.—The four track system of this company at Harrisburg, Pa., is to be extended to Middletown, 9 miles.

Petroleum.—It is said that the Petroleum Railroad, extending from Titusville to Erie, Pa., projected and partly built several years ago, will soon be completed. It will be under the management of the New York, Lake Erie & Western.

Philadelphia & Reading.—Several of the conductors on this road have presented a petition in the Philadelphia Circuit Court asking for a determination of their rights under the agreement made by the company with the conductors in May, 1876. The agreement was that the company should retain 25 cents per day out of each conductor's wages and invest the money in Reading stock for his benefit, and as dividends accrued, additional stock should be purchased for him. The petitioners claim that up to March of this year there had accrued to the conductors who were parties to the contract \$137,615.93; that the money had not been invested as the company agreed, but as if it belonged to the company. The company contends that the conductors are entitled to only so much as the shares would bring in the market. Judge Butler has referred petition to Special Master George M. Dallas to take testimony.

Pittsburgh, Lackawanna & Northwestern.—Judge Barrett, of the New York Supreme Court, has authorized the name of this company to be changed to the Central New York & Southwestern. The charter provided for a road from Perkinsville, Steuben County, to Geneva, Ontario County, with a branch to Naples, but no work has ever been done. One reason given for the change of name was that the company is insolvent. Another was that an amalgamation is in order between the new company, the Rochester, Hornellsville & Lackawanna and the Lackawanna & Pittsburgh, and that when this is made the New York Central & Hudson River company is to take charge of things and build the new road.

Pullman's Palace Car Co.—This company won its case last week against the Central Transportation Co. The Court granted a preliminary injunction restraining the latter company from prosecuting suits for the recovery of rental under the terms of the original lease accruing since July 1, 1886, the time the surrender was made. The Court also enjoined the defendant company from paying \$12 a share dividend to its stockholders, representing the reduction of par value from \$50 to \$38 per share, and declared the resolutions of reduction passed by the Central Transportation Co.'s directors to be invalid.

Rome & Carrollton.—J. D. Williamson, President of this company, advertises for bids for building 140 miles of standard gauge road and 8 iron bridges in Tennessee and Georgia.

St. Louis & San Francisco.—Judge Donahue has granted Oppenheimer & Co., of New York, a mandamus to compel the officials of the company to open the stock transfer-books for inspection.

Ward & Levy, of Fort Smith, Ark., have a contract for the first 17 miles of the branch east from Hackett City, Ark.,

It is said that the extension from Fort Smith to Paris, Tex., will be opened in 90 days.

The books prove that the most important stockholders are the following: Of common stock—Jay Gould, 20,000 shares; Seligman Bros., 6,310; J. & W. Seligman, 6,404; Jacob Seligman, 3,444; and George Gould, 3,200. Of the preferred stock—Jay Gould, 10,000; Seligman Bros., 10,850; George Gould, 6,400; Jacob Seligman, 3,350; E. Sweet & Co., 2,450; Wasserman Bros., 2,000; Charles Head & Co., 1,700; and J. & W. Seligman, 1,300. Total held by Jay Gould and Geo. Gould, 39,600 shares; the Seligmans hold 31,558 shares. E. L. Oppenheim & Co. have in their name 11,140 shares of the preferred and 10,000 shares of common, and about 1,500 first preferred.

San Bernardino & Los Angeles.—The rails of this road were connected last week with those of the Los Angeles & San Gabriel Valley road at Azusa, Cal. The new line will be a part of the Atchison, Topeka & Santa Fe system. It gives a through line from Los Angeles to San Bernardino, over which the through trains from Los Angeles to the East will be run.

Southern & Ohio River.—This company has obtained a charter in Indiana. Its plans were made beforehand. Work began this week. The road is to run from Lawrenceburg, Ind., through Aurora, to Rising Sun, Ind., 15 miles.

Suncook Valley.—It is reported that the Boston & Maine has obtained control of this road, which extends from Hooksett to Pittsfield, N. H., 19 miles.

Terre Haute & Mississippi River.—Organized in Indiana. The object is to build a road from Terre Haute, Ind., to a point on the Mississippi River about 75 miles below St. Louis, Mo.

Wabash, St. Louis & Pacific.—The round house at Des Moines, Ia., containing 13 locomotives, was burned on April 27. It is reported that the loss is in the neighborhood of \$100,000.

West Virginia Central.—The stockholders have voted to extend the road from a point near Davies, W. Va., southward to Charleston, the state capital, a distance of 100 miles.

TRAFFIC AND EARNINGS.

The Inter-state Commerce Commission.

The Commission has been holding sessions during the past week at Atlanta, Ga., Mobile, Alabama, New Orleans, La., and Memphis, Tenn., with the object of finding any special cases where exceptional orders should be made for relief from the ordinary operations of the Inter-state law. The arguments of those favoring an enforcement of the 4th section of the law and those asking for a repeal of the same were heard separately by the Commission.

The Oregon Railway & Navigation Co. and the Union Pacific have filed their petitions with the Commission asking relief from the 4th section of the law.

The Lehigh Valley has filed with the Commission a petition against the Philadelphia & Reading, asking for an investigation and decision of the question of free baggage allowances upon the registry and indemnity certificates of the Traders' and Travelers' Union of New York. These certificates entitle the holder to 300 pounds of free baggage, while passengers not having them are allowed only the usual 150 pounds. The Lehigh Valley alleges that such exception is to compel its road to grant the same allowances on the same terms, and, failing to do so, the Philadelphia & Reading is given an undue advantage. The petition asks decision whether the allowance made by the Reading is not in conflict with the Inter-state law.

The State Department at Washington have received and transmitted to the Commission a letter from the United States Commercial Agent at London, Ont., in which it is said that the result of the act has been most damaging to the trade of both countries, and is severely felt by buyers and sellers to and from the United States. The letter says that a settlement must shortly be arrived at for relief in the matter, or United States commerce will receive damage that it will take years to repair.

The Wheat Reserve.

The exports of wheat and wheat flour are now about 3,000,000 bushels a week, from all ports, and Bradstreet's estimates that our reserve is diminishing, by export and home consumption, at the rate of 8,400,000 bushels weekly. But the exports since last July have been equal to all of the surplus of the crop of 1886, and hence we are now running on the reserve left from the crop of 1885. That reserve is estimated at from 75,000,000 to 85,000,000 bushels. The shipments of wheat from the new crop of India for the five weeks ending May 1 to the United Kingdom and the Continent were 2,600,000 bushels this year, against 3,575,000 bushels for the same period last year.

Trans-Mississippi River Percentage.

Chairman George R. Blanchard, of the Central Traffic Association; Chairman Midgley, of the Southwestern Statistical Bureau, and Chairman Farthorn, of the Bureau of Statistics of the West and Northwest, have arranged a basis of percentages for rates from the Mississippi River, westward. The new basis has been accepted by the Eastern trunk lines. Instead of making the Mississippi River the dividing line, Chicago is now the dividing line, and all rates are based on Chicago, the old 116 per cent. basis from the Mississippi River being entirely wiped out. There was a difference of 8 per cent. between the percentage allowed the Eastern lines and that allowed the Western lines. This difference has been so arranged that each section will bear 4 per cent.

"Milling in Transit" Rates.

The Chamber of Commerce of Minneapolis, Minn., have unanimously adopted a resolution setting forth that the Chicago, Milwaukee & St. Paul and the Chicago, St. Paul, Minneapolis & Omaha roads are making milling in transit rates to all points on their lines to Minnesota and Wisconsin except at Minneapolis and St. Paul in direct violation of both the state and inter-state laws; emphatically protesting against such discrimination, and instructing the secretary to enter a formal protest to both the state and inter-state Commissions, and requesting that both of the said roads be compelled to make the same transit rates to Minneapolis and St. Paul as to the other points on their respective lines.

Passes for the Press.

The Pennsylvania is now issuing inter-state passes to editors who sign a contract to publish matter favorable to the road, and enough to pay for the transportation asked for.

East-bound Shipments.

The shipments of all freight except live stock from Chicago to seaboard points by the various roads of the Central Traffic Association during the week amounted to 28,884 tons, against 29,822 tons the week previous. Percentages carried by each road were: Baltimore & Ohio, 11.7; Chicago & Grand Trunk, 11.9; Pittsburgh, Cincinnati & St. Louis, 7.6; Lake Shore & Michigan Southern, 23.8; Michigan Central, 16.3; New York, Chicago & St. Louis, 9.2; Pittsburgh, Fort Wayne & Chicago, 19.2; Cincinnati, Indianapolis, St. Louis & Chicago, 0.3.

Railroad Earnings.

Earnings of railroad lines for various periods are reported as follows:

Month of April:	1887.	1886.	Inc. or Dec.	P. c.
Buff., N. Y. & P.	\$190,200	\$214,600	D.	11.3
Chicago & Atl.	184,250	184,544	I.	0.1
Cin. H. & Day	251,248	215,836	I.	35.71
Ev. & Ferre H.	73,109	54,109	I.	35.1
Long Island	231,206	216,867	I.	6.5
Mil. L. S. & W.	232,263	157,475	I.	47.5
Mil. & St. Paul	1,950,000	1,763,068	I.	10.3
Northern Pac.	1,118,800	993,483	I.	12.6
Peoria, Dec. & E.	43,871	31,871	I.	37.6
St. L. & San F.	443,600	331,800	I.	33.5

Total (gross).... \$4,748,947 \$4,103,954 I. \$644,994 15.6

Month of March:

Balt. & Potomac	\$120,555	\$107,124	I.	12.4
Buff., N. Y. & P.	45,558	38,870	I.	17.1
Net earnings	217,319	204,743	I.	6.1
California South.	41,997	30,281	I.	37.6
Net earnings	143,452	56,658	I.	153.0

Cumulative & Atl. and Branches 34,805 | 33,557 | I. | 3.7 |

Cleve. & Canton 28,104 | 28,709 | D. | 2.1 |

Net earnings 6,059 | 8,032 | D. | 24.7 |

Ft. Worth & D. C. 58,975 | 23,790 | I. | 148.8 |

Net earnings 24,880 | 6,936 | I. | 256.2 |

Grand Rap. & I. 269,472 | 202,017 | I. | 33.3 |

Net earnings 120,738 | 75,580 | I. | 59.7 |

Kentuk. & West. 20,120 | 24,988 | I. | 24.2 |

Net earnings 6,802 | 8,883 | I. | 29.3 |

Mem. & Charles 127,816 | 115,171 | I. | 10.9 |

Net earnings 33,949 | 31,752 | I. | 6.9 |

N. Y., Ont. & W. 109,968 | 98,348 | I. | 11.8 |

Net earnings 11,290 | 7,157 | I. | 57.4 |

Norfolk & West. 322,470 | 277,307 | I. | 16.3 |

Net earnings 155,630 | 120,932 | I. | 28.7 |

Northern Central 510,752 | 460,147 | I. | 10.9 |

Net earnings 214,250 | 198,218 | I. | 8.0 |

Northern Pacific 1,030,679 | 858,116 | I. | 20.6 |

Net earnings 415,438 | 409,062 | I. | 1.5 |

Oreg. R. & N. 457,103 | 420,858 | I. | 8.6 |

Net earnings 224,619 | 187,041 | I. | 20.0 |

Phila. & Erie 8,497 | 290,640 | I. | 33.6 |

Net earnings 156,967 | 136,634 | I. | 14.8 |

West Jersey and Branches 100,687 | 91,046 | I. | 10.6 |

Net earnings 41,888 | 38,307 | I. | 8.8 |

Total (gross).... \$3,887,844 \$3,293,228 I. \$594,616 18.0

Total (net).... 1,553,707 1,271,430 I. 282,277 22.2

Two months to Feb. 28:

Memphis & Chas. \$281,621 | \$221,398 | I. | 27.2 |

Net earnings 79,380 | 51,537 | I. | 54.0 |

Minn. & St. L. 221,211 | 194,387 | I. | 13.8 |

Net earnings 37,304 | 24,912 | I. | 49.7 |

Nash. C. & St. L. 491,555 | 370,171 | I. | 32.7 |

Net earnings 218,403 | 147,062 | I. | 48.4 |

N. Y., L. E. & W. 3,466,252 | 3,083,090 | I. | 12.4 |

Net earnings 780,313 | 634,895 | I. | 22.9 |

Ohio & Miss. 606,247 | 548,609 | I. | 10.5 |

Net earnings 171,323 | 116,480 | I. | 47.0 |

Oregon Imp. Co. 495,841 | 379,486 | I. | 30.7 |

Net earnings 60,497 | 34,467 | I. | 75.6 |

Pennsylvania 7,840,559 | 6,971,011 | I. | 12.4 |

Net earnings 2,594,508 | 2,219,145 | I. | 17.3 |

Phila. & Erie 517,552 | 451,856 | I. | 14.5 |

Net earnings 202,378 | 167,887 | I. | 20.5 |

Phila. & Reading 3,089,077 | 2,559,567 | I. | 20.6 |

Net earnings 918,311 | 513,259 | I. | 58.0 |

Coal and Iron 2,155,771 | 1,941,136 | I. | 11.1 |

Net earnings 28,979 | 931,417 | I. | 32.2 |

St. L. & T. & C. 350,660 | 323,973 | I. | 8.2 |

Net earnings 14,493 | 23,285 | D. | 37.7 |

Shenandoah Val. 114,908 | 83,263 | I. | 37.9 |

Net earnings 9,905 | 6,286 | I. | 57.9 |

Southern Pac. Co. 4,510,424 | 4,464,017 | I. | 1.0 |

Net earnings 1,348,206 | 1,899,614 | D. | 29.0 |

Atlantic System 1,411,038 | 1,401,530 | I. | 0.7 |

Net earnings 212,974 | 217,015 | D. | 41.9 |

Pacific System 3,069,416 | 3,063,087 | I. | 0.2 |

Net earnings 1,108,242 | 1,487,635 | D. | 25.5 |

Total (gross).... \$24,121,778 \$21,242,484 I. \$2,879,294 13.6

Total (net).... 6,997,677 5,917,892 I. 1,079,785 18.2

Three months to March 31:

Cin., W. & Balt. \$529,102 | \$177,224 | I. | \$351,878 10.8 |

Cleve., Ak. & C. 122,907 | 113,670 | I. | 9,237 8.1 |

Cleve. & Mar. 78,014 | 67,434 | I. | 11,580 16.5 |

Cin. C. & C. 95,015 | 84,131 | I. | 10,884 9.9 |

Col. & Cia. Mid. 79,215 | 65,425 | I. | 13,790 21.0 |

Col. H. V. & Tol. 630,121 | 49,458 | I. | 132,663 26.6 |

Dan. & Mil. 45,641 | 45,586 | I. | 55 0.1 |

Denver & R. G. 1,684,335 | 1,329,844 | I. | 354,501 26.6 |

Den. & R. G. W. 227,076 | 211,458 | I. | 15,618 7.3 |

Des. M. & Ft. D. 79,186 | 81,849 | D. | 2,663 3.1 |

Det. B. C. & A. 89,478 | 35,967 | I. | 53,512 148.0 |

Det. Lan. & No. 246,804 | 222,011 | D. | 24,793 9.9 |

Det. M. & Marq. 42,174 | 38,777 | I. | 3,397 7.9 |

E. Ten. Va. & G. 1,211,800 | 1,009,440 | I. | 212,360 21.0 |

Evan. & T. H. 177,921 | 154,734 | I. | 23,187 14.2 |

Flint & Pere Mar. 578,341 | 511,620 | I. | 66,721 11.8 |

Fla. Ry. & N. Co. 281,577 | 251,812 | I. | 29,765 11.8 |

Ft. W. & Den. C. 134,508 | 74,215 | I. | 59,293 79.9 |

Georgia Pacific 269,079 | 188,677 | I. | 74,402 39.4 |

Grand Rap. & I. 508,681 | 419,117 | I. | 89,564 21.3 |

Gr. Trunk of C. 4,077,688 | 3,686,088 | I. | 391,600 10.6 |

Gulf, Col. & S. F. 546,922 | 436,920 | I. | 128,002 29.2 |

Houston & T. C. 583,174 | 564,033 | I. | 19,141 3.3 |

Illinois Central 1,638,904 | 1,452,009 | I. | 186,895 12.8 |

So. Division 1,046,566 | 1,009,308 | I. | 37,258 3.6 |

Col. F. & C. 37,565 | 37,565 | I. | 0 0.0 |

Dub. & S. C. 198,148 | 203,304 | D. | 5,156 2.6 |

I. F. & S. C. 145,276 | 133,204 | I. | 12,072 8.3 |

Ind. Bloom. & W. 628,797 | 578,896 | I. | 49,901 8.6 |

Ind., Dec. & Spr. 109,217 | 96,182 | I. | 13,035 13.6 |

Total (gross).... \$10,974,979 \$14,875,524 I. \$3,900,545 34.1

Five months—Nov. 1 to Mar. 31:

Ft. W. & Den. C. \$235,360 | \$151,069 | I. | \$84,270 55.7 |

Net earnings 109,782 | 48,687 | I. | 61,095 125.4 |

Six months—Oct. 1 to Mar. 31:

Buff., N. Y. & P. \$1,322,138 | \$1,202,288 | I. | \$119,850 9.1 |

Net earnings 51,507 | 267,493 | D. | 215,986 80.7 |

N. Y. & New E. 2,018,881 | 1,816,036 | I. | 202,845 11.1 |

Net earnings 689,224 | 638,352 | I. | 50,872 7.9 |

Nine months—July 1 to March 31:

Louisv. & Nashv. \$1,389,966 | \$1,045,806 | I. | \$1,344 |